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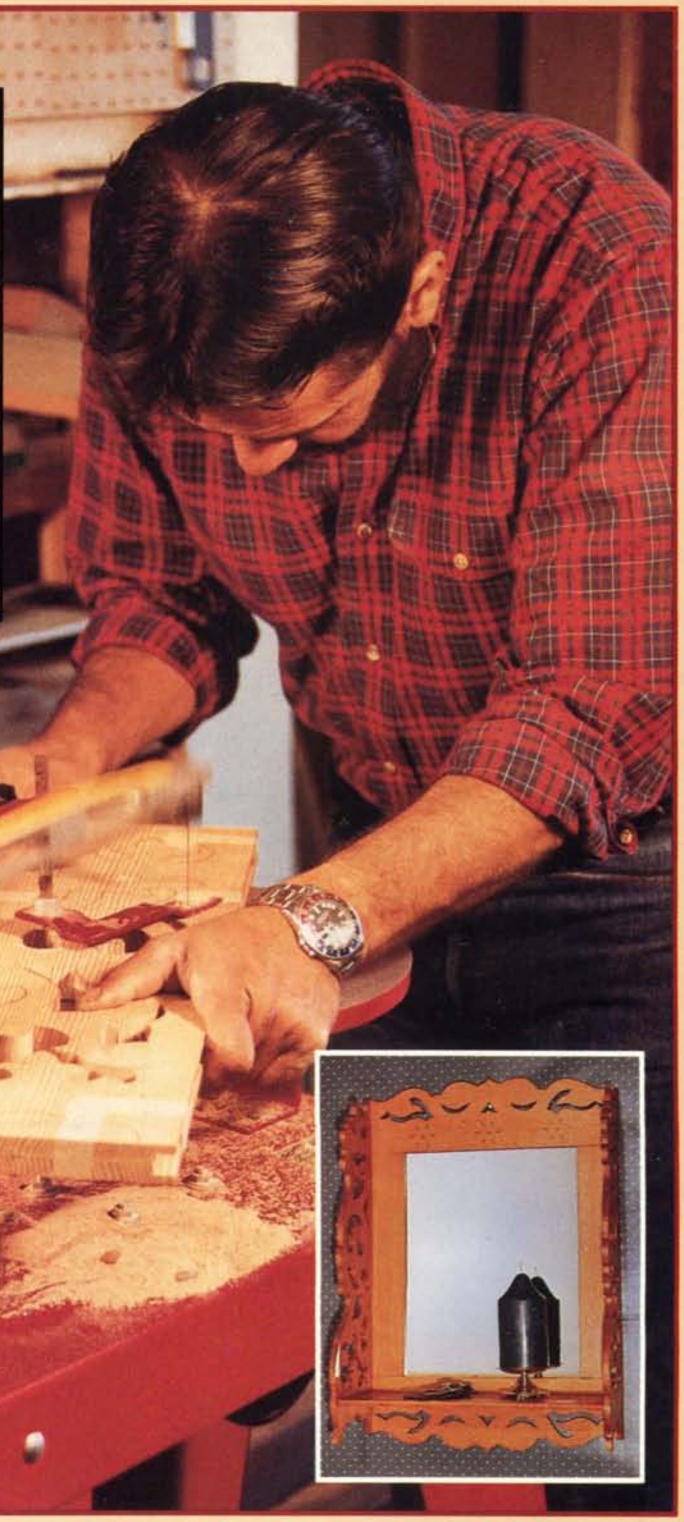

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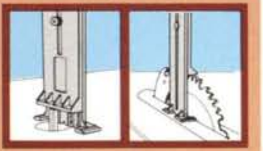

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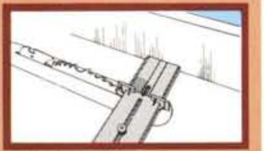

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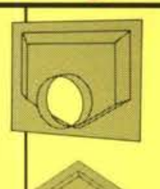

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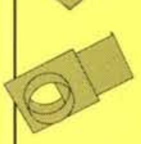

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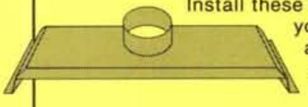

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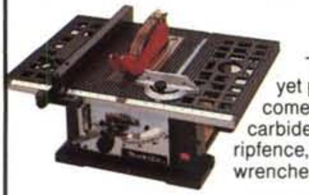

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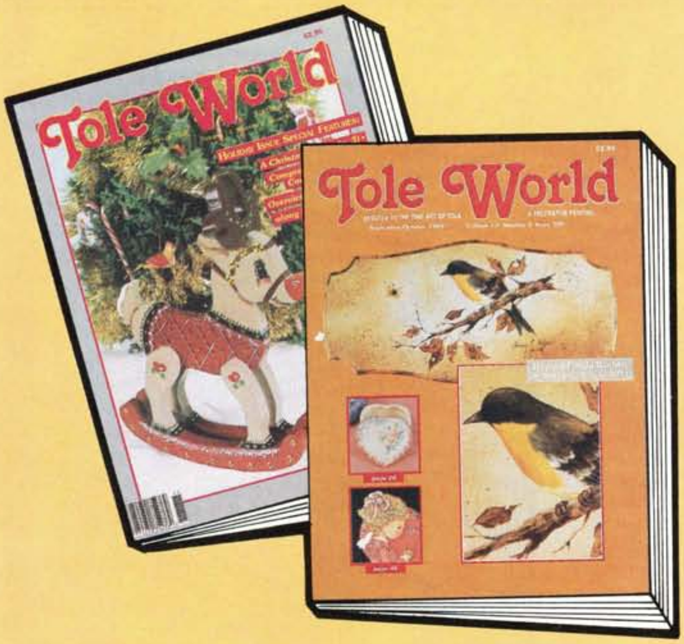

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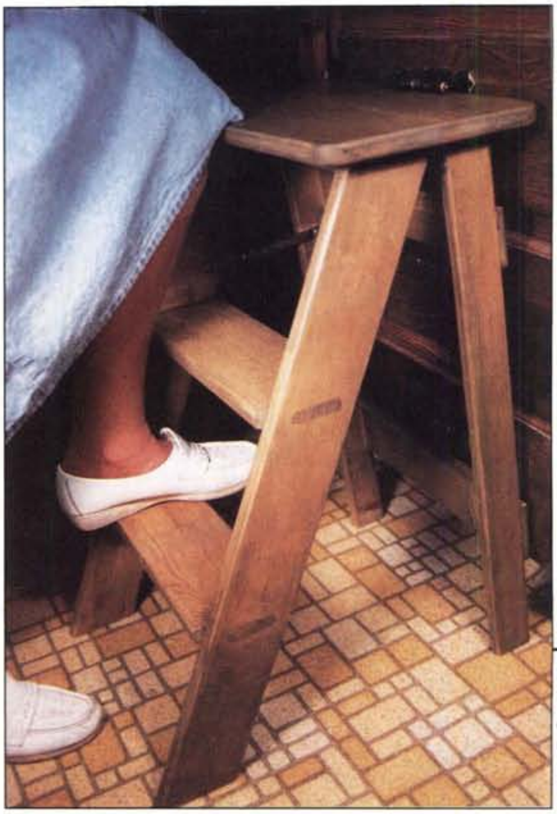

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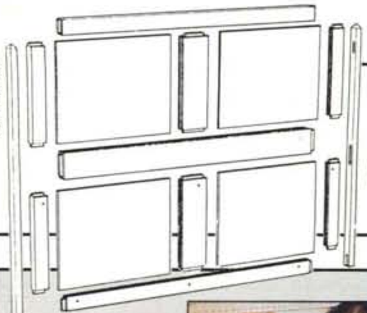

Tom Larson

On the Cover

Dan Evans of Benicia, California makes the center cuts in our "Fretwork Shelf and Mirror," a project by Devore O. Burch. Instructions for making this project begin on page 36, and full–size patterns are included in the PullOut™ Plans section in the center of this issue. Hawk® scroll saw courtesy of RBI Industries, PO Box 369-PW, Harrisonville, MO 64701.

David M. Camp

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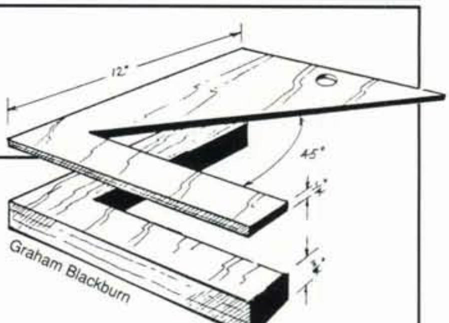

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Clear Cuts

Why can't the world be open twenty four hours a day? I'm often working round the clock; I dream up projects or lay out articles in my sleep (sometimes they look it, I admit). But why can't everyone else be doing their jobs when I need them? Why can't I get a few more 1-1/2" phillips flat head wood screws after six on a Sunday? That's always when I need them...

I have a running list of projects (mostly remodeling stuff, still), and when I cross off one item, even if it's three o'clock on a Sunday, I go to the lumber rack and start figuring out what I need for the next project.

By four twenty I've designed it, figured it out mathematically, and made lists for the lumber yard and the hardware store. My Beloved always tilts her eyes toward the ceiling when she sees me making that mad dash through the house for my checkbook, wallet and keys at four twenty–seven. Seconds later, I'm on the road, pushing the speed limit more than I usually do. I know that if I've got my materials, I can keep working until nine o'clock.

Ten to five at the lumber yard: "I thought you closed at five thirty." "Nope, five o'clock." "Okay, well, this won't take long," I lie. "I just need..."

I know that Hardware Emporium is open nearly all the time, and I know they'll have everything on my other list. It won't be long till I'm cutting wood again, drowning out the neighbors' Sunday dinners. Then I pull into the Hardware Emporium parking lot, just as their last employee is pulling out. It seems they close "early" on Sundays because they stay open so late the rest of the week. "Swell," I say. (You'd think I'd know this by now.)

That leaves the local supermarket/drugstore to meet my hardware needs. Cross off the router bit. Cross off the drywall screws. I suppose these hinges will work instead of the ones I wanted... Cross off or substitute most of the other items on the hardware list. At least I'll be able to get cold juice and a candy bar to make skipping dinner easier.

I glug them down in frustration as I pull onto the freeway and discover that the truck has no problem going from zero to twelve in four point eight minutes. I join the herd of motor homes returning from the lake, many with boats trailing behind them like calves. Many look familiar to me from previous Sunday–night supply runs.

Do you suppose they laugh if they recognize the red T–shirt stapled to the ends of my ten–footers? It's the same flag I'm always flying, every Sunday night.

I pry away from the cattle at seven fifty–four; I get home at eight–o–seven. I begin to accept the fact that I probably shouldn't turn on a machine—if not for the neighbors' sake, at least so I won't be locked in the garage for the night by my wife.

At least I can unload the stuff neatly into my lumber rack; I'll be ready to go bright and early next Saturday; I'll have everything right here.

But it won't matter. I can start cutting at eight AM Saturday (neighbors be damned). You can be sure that I'll finish that job at three o'clock Sunday. Then I'll want to start in on the next one.

David M. Camp

Letters

Popular Woodworking *welcomes your comments, pro or con, about articles we publish. Send your letters to: Editor,* Popular Woodworking, *1320 Galaxy Way, Concord, CA 94520. Letters may be edited for publication.*

Eight Well Furnished Parlors

As the father of eight daughters, I make their Christmas presents every year. This year, I made them each a parlor cabinet from the PullOut™ Plans in your November Issue (#51).

I changed the length of the legs to 48" instead of 39". I built the first one according to plan, but the girls wanted to have them higher. Made of oak at $5.49 a board foot, each one cost about seventy dollars.

I enjoy your magazine very much; keep up the good work.

Richard L. Dibble
Kenosha, WI

Chief Joseph by the Numbers

I'm a novice woodworker after having worked in steel as a die sinker for many years.

In the November 1989 Issue (#51) your Focus on Carving column ("Carving an Indian Portrait") caused a real problem for me, as the dimensions are given in millimeters. I have a millimeter scale, and I laid out the top view and then looked at Figure 2 and did some measuring prior to any cutting. I found that if I cut 24mm and 28mm from the centerline of the head I would be cutting off part of the head (side) of the carving. Can you please help me (and perhaps others) by giving dimensions in good old American inches? Any help in understanding this carving of the Chief would be appreciated.

Your inclusion of articles on carving in each issue is a good selling point and welcomed.

Norman Chapin
Newnan, GA

The author replies: *thank you for pointing out my error. Figures 1, 2, and 3 were prepared in half scale. When the measurements were made, I forgot to scale them up for Figures 2 and 3. Figure 1 is OK. The measurement values in 2 and 3 should be twice those printed. I regret any inconvenience this oversight has*

continued on page 8

caused my fellow carvers.

As far as measuring units go, inches are not an American system but an English system based on the length of a king,s arm; its advantage is that it is easy to divide by half. This is all right for straight measurements; but when you need to scale by multiplying and dividing, as I often do in carving, then it becomes very cumbersome and prone to error. It is so unwieldy that even the English who invented it have abandoned these units in favor of the metric system, which is built on a base of ten. You already use this system for counting, drinking, and paying your bills, so it should not be that difficult to measure based on a unit of ten.

Popular Project

The butterfly figures from Issue #52 (January 1990) were quite popular with my family and friends. I enjoy your projects very much!

Steve Moore
Pomona, CA

Foresters and Forestry

I read with interest your editorial on what is happening to wood, our friendly renewable resource which is so beneficial to all of us ("Clear Cuts," Issue #52, January 1990).

I grew up in Finland, and studied commercial forestry after World War II. Though the program was directed toward the commercial uses of forest products, the studies included all aspects, beginning with forest surveys, selective marking and cutting, transport, saw mills pulp and paper factories, pre–fab housing plants, and sales and exports. These studies also included planting.

Whenever we found a big birch, pine or spruce which was a "specimen leader," we would fence it in and collect its seeds for planting, trying this way to improve the forests.

I now live in the Northwest and am appalled at all the clear cutting with little effort at replanting. Driving along the roads one is impressed by the abundance of trees, but upon stopping and walking a few hundred feet into the forest, one often comes to clear cut clearings—some several years old—with no signs of reforestation.

When flying over the Cascades, I feel sick at all the clear cut areas. Seldom can I spot any new planned tree growth. Now the timber companies want to cut old growth, as apparently they have run out of logs to ship overseas to Japan, Korea, China, Taiwan, etc. with no regard for life here. From where I sit and write this, I see log rafts being towed to the Port of Tacoma for shipment daily.

Last spring, the Weyerhaeuser Company advertised over local radio that they planted over 400,000 thousand seedlings daily during planting season. When I studied forestry in Finland, it took an average of 30 minutes to properly plant a seedling and hope it would grow into a tree. Calculating 400,000 trees, that comes to 200,000 man hours, or 25,000 men working eight hours a day. In discussing this with friends, we concluded that the public was fed another snow job.

Nils Lucander
Tacoma, WA

Oil Update

To update my article "Household Cooking Oils as Wood Finishes" (#52), readers might like to know that Livos Plant Chemistry has moved to a larger facility. Their new address is: 1365 Rufina Circle, Santa Fe, NM 87501.

Harold James
Somerville, New Jersey

Organic Oil Objection

The article on applying cooking oils to wooden bowls was very interesting to me. Even though the "experts" use them and claim that others should, too, there is an obnoxious rancid odor that develops in wooden articles when salad oil is used. Since they are organic, they will not stay fresh for very long before becoming rancid and foul–smelling. Some will say that it can be eliminated by rubbing in a little bit of garlic, but garlic is also organic, and in time, it will add to the odor.

I prefer to rub in several coats of water–clear mineral oil from the local pharmacy. The oil is not organic, can be taken internally (in small amounts), as in a bowl finish—very little of which comes off when in use.

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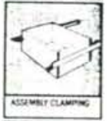

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C1002	5/16	$6
C1003	3/8	$6
C1004	1/2	$8
C1005	5/8	$10
C1006	3/4	$10
C1007	1	$12

1/2" SHANK

PART NO.	D	PRICE
C1008	1/4	$6
C1009	5/16	$6
C1010	3/8	$6
C1011	1/2	$8
C1012	1/2	$15
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PART NO.	A	PRICE
C1157	1/16 R	$11
C1158	1/8 R	$11
C1159	3/16 R	$11
C1160	1/4 R	$12
C1161	5/16 R	$13
C1162	3/8 R	$15
C1163	1/2 R	$16

1/2" SHANK

PART NO.	A	PRICE
C1171	1/2 R	$16
C1172	3/4 R	$20

ROUNDOVER

1/4" SHANK

PART NO.	A	PRICE
C1174	1/16 R	$11
C1175	1/8 R	$11
C1176	3/16 R	$11
C1177	1/4 R	$12
C1178	5/16 R	$13
C1179	3/8 R	$15
C1180	1/2 R	$16

1/2" SHANK

PART NO.	A	PRICE
C1187	1/2 R	$16
C1188	5/8 R	$20
C1189	3/4 R	$20
C1190	7/8 R	$34
C1191	1 R	$34
C1192	1-1/4 R	$40

DOVETAIL

1/4" SHANK

PART NO.	D	PRICE
C1067	1/4	$7
C1068	3/8	$7
C1069	1/2	$7
C1070	9/16	$8
C1071	3/4	$9

1/2" SHANK

PART NO.	D	PRICE
C1074	1/2	$7
C1076	3/4	$9
C1077	1	$12

COVE

1/4" SHANK

PART NO.	A	PRICE
C1138	1/16 R	$12
C1139	1/8 R	$12
C1140	3/16 R	$12
C1141	1/4 R	$13
C1142	5/16 R	$14
C1143	3/8 R	$15
C1144	1/2 R	$16

1/2" SHANK

PART NO.	A	PRICE
C1149	1/2 R	$16
C1151	3/4 R	$28

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1/4" SHANK

PART NO.	A	PRICE
C1153	5/32 R	$16
C1154	1/4 R	$18

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PART NO.	A	PRICE
C1155	5/32 R	$16
C1156	1/4 R	$18

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90-C103

Letters continued

Carnauba wax can also be used. Some people feel that its not safe for bowls which will be used for eating, but check the labels on many chocolate candies; you'll find that carnauba wax is used quite extensively in chocolate blending to keep it stiff in warm weather.

Don Kinnaman
Phoenix, AZ

Organic Oil Endorsement

I enjoyed the article "Household Cooking Oils as Wood Finishes," in the March 1990 issue. Finally the world is getting the message about the usefulness of cooking oils for wood. It is articles like this that educate the woodworker and his family about the non–toxic properties of these oils.

Being a paint contractor, and having experimented with all types of oils, I would like to expand on some of the other uses around the house of plain old vegetable oil–right out of your kitchen cabinet.

1) It can be used to thin alkyd enamel (oil–based paint) instead of paint thinner. It makes the paint track off the brush much more cleanly, and it is not smelly like pain thinner.

2) If you have low–luster enamel, you can make it glossier by adding a cup of soybean (or any other) oil to a gallon of paint.

3) Old enamel that has thickened (not hardened) because of vehicle evaporation can be rejuvenated by adding cooking oil.

4) It can be used to remove paint drops off you, your furniture and appliances, without damage to either.

5) And of course it makes a beautiful wood finish.

Bear in mind that since cooking oil contains no driers, it will take longer for the paint to set, but when it does dry, it will be just as hard.

Del Duncan, President
Truly Persnippity Paint Co.
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Tricks of the Trade

"Tricks of the Trade" shares readers' tips for making woodworking tasks easier and safer. If you've come up with a trick that would help other woodworkers, send it to "Tricks of the Trade" C/O Popular Woodworking, 1320 Galaxy Way, Concord, CA 94520. Include any photos or sketches that help illustrate your idea (we'll redraw them). We pay $25 for each trick we publish.

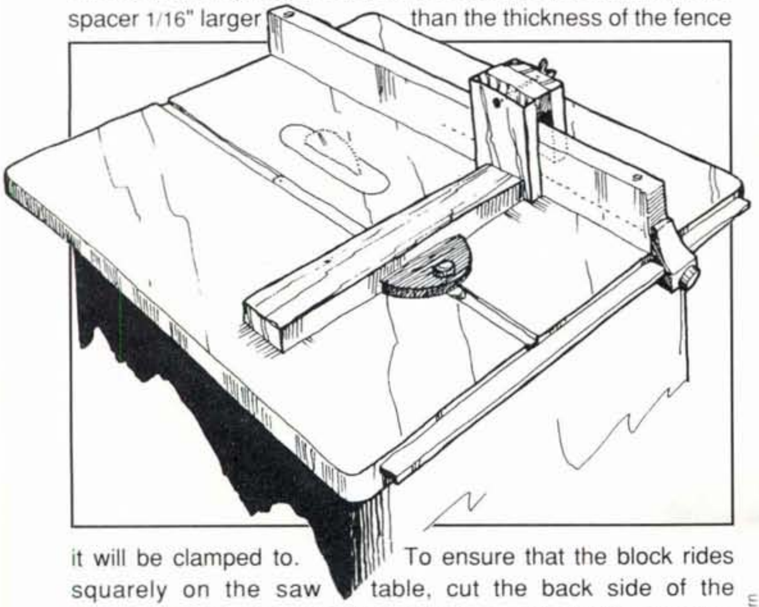
Precise Hinge Placement

When installing butt hinges between a cabinet door and a frame, it's hard to know exactly where to drill the holes. Here's a method I use: I attach one leaf of each hinge to the door and then spread a five–minute epoxy on the other leaf. I tape a layer of plastic between the leaves to keep the epoxy from bonding it in a closed position, then slip the door into its frame and shim it into position within the opening. When the epoxy has cured, I open the door and install the wood screws.

Devore O. Burch
Fort Worth, TX

Self-Clamping Fence Block

If you've ever clamped a block to your table saw fence to facilitate repeated and accurate cross–cuts, you know how useful such a jig can be. Make it even handier by constructing this self-clamping block out of 3/4" stock and one carriage bolt with washer and wing nut. When you cut the three pieces, make the spacer 1/16" larger than the thickness of the fence it will be clamped to. To ensure that the block rides squarely on the saw table, cut the back side of the clamp—the side away from the workpiece—shorter than the side butting the workpiece. If you make the clamp block almost twice the height of the fence, the clamping bolt will have plenty of room to do its job. Join the sides to the spacer with dowels and glue. If you have a drill press, bore two holes through the spacer; then line up the sides and continue drilling into them. Sand the dowels for a loose fit (or drill the holes slightly oversize) to make sliding and clamping easier.



Illustrations by Graham Blackburn

Ken Hill
Springfield, MO

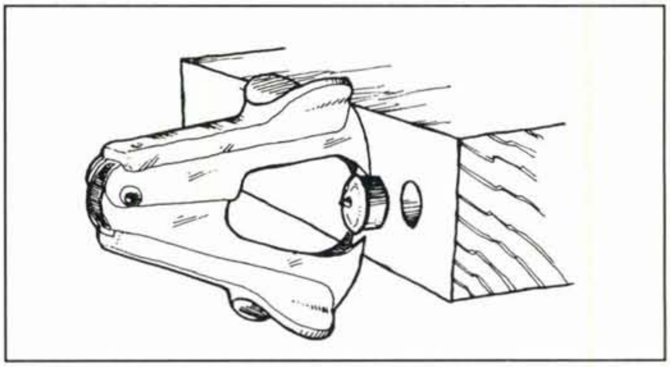
Reducing Slippage

Non–slip tape is available in many widths and comes with a pressure–sensitive adhesive backing. It's great for many uses in the shop. I have applied some to the face of my miter gauge to keep the wood from sliding when I make sharply angled cuts. I also applied some to the jaws of my doweling jig. This keeps the jig from sliding or turning while I drill. As a result, it doesn't have to be cinched down as tight, and it's easier to remove.

Richard H. Dorn
Oelwein, IA

Dowel Center Remover

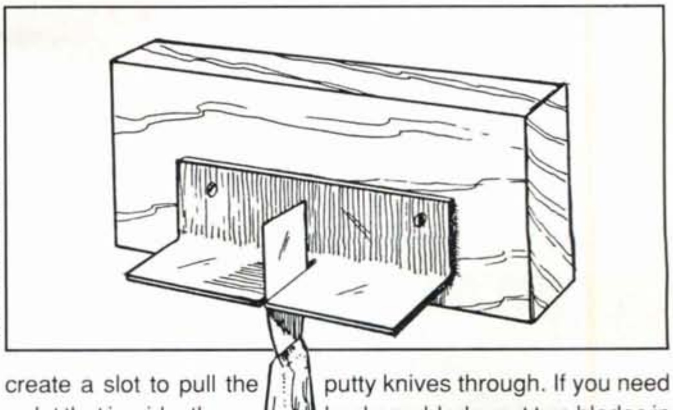
A good drill bit will make a crisp, clean accurate hole. As a result, dowel centers often fit tightly and are difficult to remove with your fingernails. A modified staple remover will quickly and effortlessly lift the dowel centers out of the holes. As purchased, the staple remover won't open wide enough to fit over the dowel centers. To increase the throat opening, simply remove the pivot pin by drilling off the head, file the two stops to gain more clearance, bend the spring slightly to maintain tension in the open position, and reassemble the staple remover with a new pivot pin. Store this device with your dowel centers, and save your fingernails.



Richard H. Dorn
Oelwein, Iowa

Cleaning Putty Knives

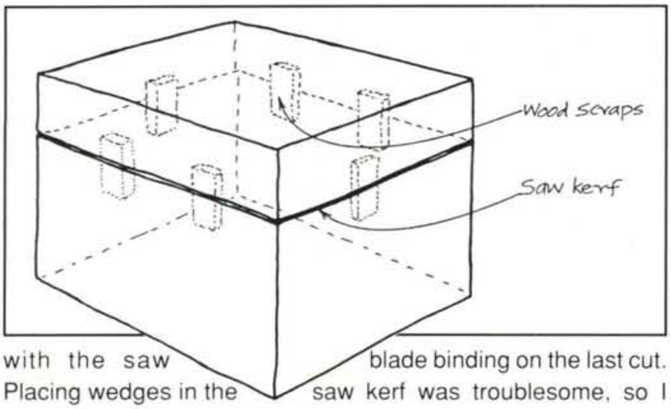
Here is a quick way to remove residual materials from the blade of a putty knife. Mount a 2" long piece of 1-1/2" or 2" angle iron to a small piece of plywood and hang it near your putty knives. Cut through one half of the angle iron with a hacksaw to create a slot to pull the putty knives through. If you need a slot that is wider than a hacksaw blade, put two blades in the saw frame to make the cut.



Don Kinnaman
Phoenix, Arizona

Non–Binding Lid

It is a common practice when making wooden boxes to make the box and its lid as one unit and cut the lid free after the glue has set. This eliminates any alignment problems that may arise out of making them separately. Unfortunately, I often have problems with the saw blade binding on the last cut. Placing wedges in the saw kerf was troublesome, so I came up with this idea: before assembling the box, I use double–sided tape to attach several scraps of wood to the inside, where I would be cutting. I set the saw blade about 1/32" beyond the thickness of the box wall so it can't cut through these scraps, and they hold the lid in place with no binding.



Gerald Hunt
Swartz Creek, MI

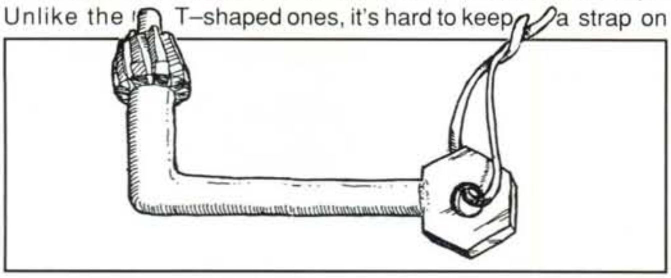
Band Saw Throat Plates

The throat plates for band saws are usually chipped, nicked, and the opening for the blade is greatly enlarged. The opening is usually pretty large to begin with, to allow the blade to clear when the table is tilted. This enlarged opening is dangerous when small pieces are cut because there is no support directly under the work. To end this problem, I made my own throat plates by gluing two pieces of plastic laminate back to back with epoxy glue. The two pieces make a combined thickness of 3/16", the same as my old insert. Cut the throat plate slightly oversize and file or sand the edge until it fits the opening precisely. Cut the kerf with the actual blade you plan to use with the insert. The bright color of the laminate adds to its safety. I place a small drop of liquid rubber under the rim to keep it from turning; the rubber peels off easily when you need to install a new blade. Keep your old throat plate for times when you want to tilt the table.

Richard H. Dorn
Oelwein, IA

Retaining the Chuck Key

Many portable electric drills come with L–shaped chuck keys. Unlike the T–shaped ones, it's hard to keep a strap on them for attaching them to the cord. I solved this problem by welding a nut to the end of the chuck key. I feed a plastic wire tie through the nut to secure the key to the cord.



Heather Dull
Huntertown, IN

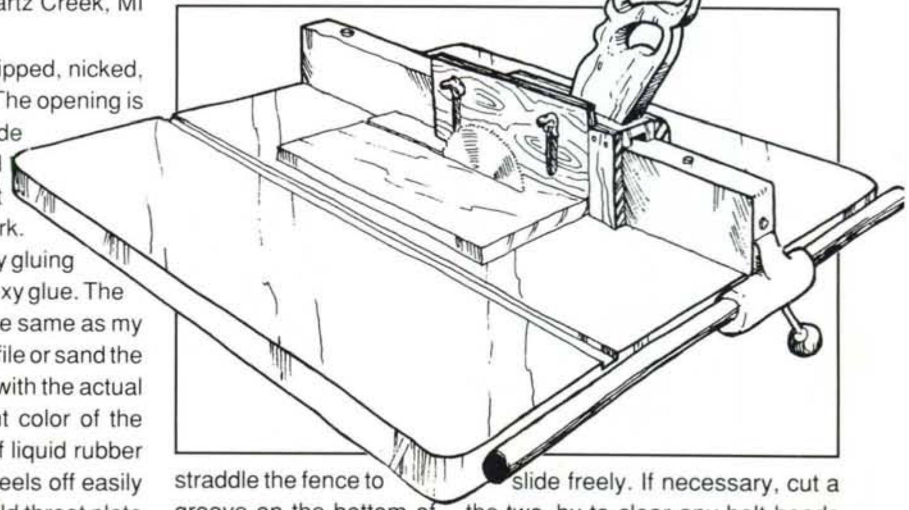
Router Jointer

How often we need a tiny jointer! Convert your router, router table and any straight–faced bit into just such a tool by screwing a thin piece of plastic laminate to the receiving half of the table's adjustable fence. I used 1/2" #4 flat head screws, carefully countersunk. Slightly bevel the receiving end of the plastic laminate so that the work feeds freely through the cutter and along the fence. When setting up your router jointer, adjust the fence with care so that the depth of the cut equals the thickness of the plastic laminate.

Don Stutzman
Johnstown, PA

Thin Strip Pusher

I came up with this device for pushing material between the table saw fence and blade when the setting is too narrow for traditional push sticks. It features a built–in adjustable hold–down to keep the wood flat on the table. Make yours by ripping a scrap piece of two–by to a width that is just slightly wider than your fence; this extra width is to allow the two pieces that straddle the fence to slide freely. If necessary, cut a groove on the bottom of the two–by to clear any bolt heads that may be in the way; this piece needs to be able to ride freely on the fence, and it supports the whole jig. I used 1/2" scrap for the piece that runs on the back side of the fence, and cut it to a width that is short of reaching the saw table. The two pieces on the other side (the pusher and the hold down) were made from 1/4" plywood. The pusher is sized to reach all the way to the saw table, and the hold down is slotted for the bolts with wing nuts that allow it to be adjustable. I bought a replacement handle for a hand saw at the hardware store, cut it at an angle that felt comfortable to me, and attached it to the jig by screwing into it from the bottom. If you like, you can just trace the handle from one of your own saws and cut it out.



Devore O. Burch
Fort Worth, TX

by Ken Sadler

Selling and Marketing

If you can't sell what you make, you *don't have* a business. Having created fine things, you want to put them in the hands of someone who will appreciate them and pay a good price for them. Marketing and selling are the basic tools for transferring your creations to the consumer. The two terms are different and to be successful, you must employ both. Marketing means getting a product to a market. It is a process by which you get goods to a place where the consumer can buy them. Selling is an action by which you attract prospective buyers and convince them to buy.

No shop can prosper today without an active salesman. Whether you like it or not, if you're the owner, you're going to have to be that salesman. To whom you sell will depend on what kind of a shop you have, but sell you must. Here is a rule I learned many years ago and have followed, with great success: the person to whom you wish to sell something is not interested in you or your product. They are primarily interested in what that product will do for them. "What's in it for me?" is the question in their minds. This rule should be the basis of any sales pitch, spoken or written.

__Ken Sadler__ is a retired furnituremaker in Sheridan, Oregon.

Let's say you're trying to sell a rocking chair to a visitor to your showroom. You say "This is a very comfortable chair. Just try it; you can sit in it for hours. It's handcrafted by timeless methods and will be around for your grandchildren to enjoy. It's simple style will fit in with any decor you may have." The emphasis is on how the buyer will gain by buying. What you say will depend on who you're talking to. You'll say something entirely different to a dealer who is planning to resell the chair.

Marketing methods vary, depending upon what type of shop you run. In my experience, small woodworking shops fall into three categories: semi–production shops making pieces *in small quantities*, independent craftsmen, making one–of–a–kind pieces either by themselves, or with one or two helpers, and cabinet shops that specialize in custom built–ins. This last category is very different from the other two and deserves an entire column's worth of discussion; for now, let's talk about semi–production and one–of–a–kind shops.

The Semi–Production Shop

A very simple way to make a market survey for this type of business is to make the rounds in your area. Stop in all the small stores that sell your type of mer-

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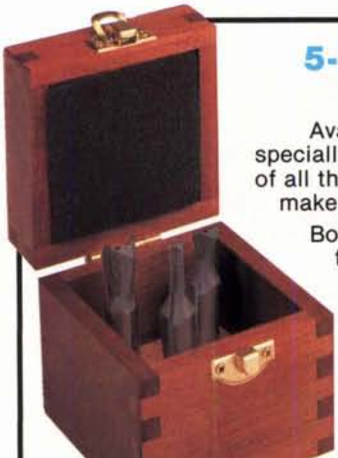

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chandise, go to all the art fairs and look in as many mail order catalogs as you can find. See what your competitors are selling, and then make the same sort of item. This may sound silly, but it's not. If other shops are selling it, people are buying it. You can vary the design some, change the style a little, but don't change the purpose. Starting with some way–out idea that you think is great but that no one else is selling is a good way to lose your shirt. By the way, don't listen to your friends. They'll tell you it's great and that you'll make a million, but they'll be the ones who don't buy when it's in the store.

Another way to survey the market is to contact several manufacturers' representatives in your field. Show them samples of the items you want to make, and ask if they think they can sell them. They know the market; they make their living selling to it. There's a third way you can find out if the items you want to make will sell. Put those same samples in the car and make the rounds of all the gift stores in, say, a 100–mile radius of your shop. See how many orders you can get, and listen to what the store owners have to say about your items.

All this assumes that you have made the necessary studies to determine that you can make these items at a profit and have calculated what your prices should be. For heaven's sake, don't start on your survey without having done this.

The semi–production shop has three main avenues to the consumer: gift and similar small stores, direct sales, and mail order. Each of these avenues has its pros and cons. I'll try to lay them out.

Gift Shops

Marketing through gift shops and similar small stores has *one major* drawback as far as the small operator is concerned: your take is going to be, at most, 50% of the retail price. So remember, when you determine your prices, if the consumer pays $10, the most you're going to get is $5. For someone just starting in, the easiest and least expensive way to sell to this market is the same one used to make your market survey: put the samples in the car and make the rounds personally. The main disadvantage with this is that it's very time–consuming; and once you've built up a substantial backlog of orders, you won't be able to do both the selling and the making.

Another way to reach the gift show market is through manufacturers' representatives. These people cover sizeable areas, usually several states, and represent a number of different manufacturers in the same field. However, you don't want one who also represents a competitor. Good "reps" are hard to get because they usually have a full list of clients. If they like

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your line and think they can sell it, and if your commission rate is attractive enough, you can probably persuade one to take you on. Be careful in this selection process; a lot of your future is riding on this choice.

The third path is, for many, the most interesting and exciting—at least for the first several times they tread it. This is often called "the gift show game." At different times of the year and in different major cities around the country, large trade gift shows are held. The participants are manufacturers—large and small—of the items found in small gift stores or in the gift departments of large stores, as well as in many mail order catalogues. The people coming to these shows are the store buyers, and they usually buy for a season or sometimes for the whole year. I have a friend who works three shows a year: one each in the east, the midwest and the far west. He gets 75% of his annual sales from these three shows.

Doing a show is not cheap. The cost of even a small booth is several hundred dollars; and since the shows last a week, you have the cost of a hotel and meals plus transportation to and from the show city. It all adds up to a tidy bundle. The cost–effectiveness obviously depends on how many orders you get. If your line sells well, this is a better method than selling through a manufacturer's representative to whom you pay a 10% to 15% commission. What's more, you have better control over everything. *[Editor's note: for more information about this marketing avenue, see "The Business End: Wholesaling Crafts at Trade Shows" in* Popular Woodworking *#39, Oct/Nov 1989.]*

Direct Sales

Deciding to use the direct sales method of marketing will depend on what you see as the future of your semi–production shop. If you're content to stay a "mom–and–pop" outfit, making a good living and perhaps a little extra, direct sales will serve you forever. On the other hand, if you want to grow and eventually get into the big bucks, then it will be a good beginning. Economically, its big advantage is that you get the retail price. This provides quite a bit of elbow room when you're just getting going. Added advantages are that the costs are the lowest of any of the methods, and you get into close contact with your end users which allows you to monitor what sells and what doesn't.

For direct sales, I recommend combining two approaches: your own show room and a booth at art shows and local craft fairs. Having your own showroom presupposes that you either live in an area where you can have the store connected to your living area, or that your workshop is in an area where people do their shopping. If you have to open a separate store, the cost rises dramatically.

The art show and craft fair circuit (at least, where I live, in the Northwest) has proved to be very good. You build a knockdown booth that you can carry in a small pickup or on top of a station wagon, load boxes of products, and off you go. Selling this way lets you live wherever you wish. My best example for the craft market is the Portland (Oregon) Saturday Market. This market is held in a river front park every Saturday and Sunday from the middle of April through Christmas. There are over three hundred booths and 3,000—5,000 people go through the market each weekend. It makes for a nice routine: make the stuff all week and sell it over the weekend for eight months of the year and take off for the other four.

Mail Order

By marketing through mail order, you also get the retail dollar, but the costs are quite a bit higher than direct sales. At this point, I'd better define the term "mail order" as I use it. The process consists of advertising for a free catalog or brochure in magazines and newspapers. You get your orders from the catalog, not the ad. This way, you build a mailing list of people who are interested in what you have to sell. The ads can be smaller and will cost less, and more people will write for a free catalogue than will order an item directly from an ad. Once your mailing list has been built, the amount of advertising can be substantially reduced. An advantage for some folks is that here, as in direct sales through the craft market, you can live anywhere you please. To me, the big disadvantage is that you have no personal contact with your buyers, and monitoring product acceptance is difficult. Also, in mail order you must ship within 24–48 hours after receiving an order. This requires carrying a much larger inventory than any of the other marketing methods.

One–of–a–Kind Shops

For the one–of–a–kind shop the problem of reaching the consumer is entirely different. Most of the emphasis is on selling rather than marketing. Even the market survey is done differently. In the one–of–a–kind business you're usually dealing with such things as furniture, sculpture, general carvings, or architectural millwork. The output is small compared to the production shop, and the volume—as well as the prices obtainable—depend almost entirely on the reputation attained by the craftsman. The reputation is developed by the style of the work he has created, by his craftsmanship, and by the amount of his work he has been able to get into the hands of the public.

Having been involved in this kind of business for many years, I have come to the conclusion that there is only one way for the craftsman who is just starting to market and sell his work. This is by direct sales: art shows, craft markets, your own showroom, and through reputable galleries. The amount that goes through the galleries should be small compared to the other avenues. However, the gallery sales are essential because this is where you begin to build the kind of reputation that brings big prices later on. But because the galleries take at least 50% commissions, you can't afford to sell too much through them. One very important tip here: never put a lower price on your work when selling it direct than you put on it in the galleries. If you do, the galleries will stop carrying it.

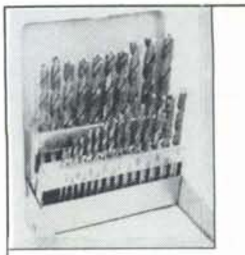
When you're just beginning, be careful not to price your work too high. At first, it's better to allow people to consider your products without price being a major factor. This gets your work out into people's homes and offices where others can see it. There is, I've found, a very good way of determining when you should increase your prices. When you have a three months backlog, raise your prices a little; when the backlog gets to six months, raise them some more. By the time my backlog had reached two years, I was asking and getting almost six times as much per piece as when I started. The process took four years.

To make this marketing method work, you will have to be a good salesman. Remember the "What's in it for me?" rule and concentrate on the person your working on. Never leave your booth unattended, and always try to speak to or at least acknowledge everyone who comes into it. This may sound like a tall order, but it pays big dividends. Your own showroom should be clean and neat and as elegant as you can make it. Use your imagination and make people feel that you are just as much an artist as a craftsman. When people come to your showroom, give them your full attention and treat them as you would guests in your home. If this causes you to lose some work time, don't worry; you will gain from every minute you spend doing it.

In the furniture and architectural fields, you'll find that you won't sell many pieces "off the floor." Those pieces will act as samples, and your customers will relate to them and ask you to make variations of them. In the long run, this is an advantage because you won't have to spend time remaking your show pieces. I had one small cabinet around for several years, and took at least ten orders based on it.

Finally, take good color pictures of each of your pieces and mount them between plastic sheets, in a fine, leather–bound book. Keep this book available in your showroom and at shows. Make a similar one for each of the galleries that carry your work. Create a business card that shows the location of your showroom, and have a supply at all shows and in each gallery.

Whether you make artsy custom furniture or mass produced recipe holders, you can't stay in business if your products don't sell, and you can't sell your products if you don't get them to market. PW



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Book Reviews

by Hugh Foster

Shaker: Life, Work and Art by June Sprigg and David Larkin, ©1987 (Stewart, Tabori & Chang, 740 Broadway, New York, NY 10003) 272 pp., hardcover, $40

This book doesn't quite belong "on the coffee table," for it verily insists that it be read. It isn't really a book about woodworking, and there are no plans here, not even a measured drawing. But there are about eight dozen sumptuous color photos certain to inspire a woodworker to head for the shop and to build "Simple Gifts" beautifully. With John Kassay's *The Book of Shaker Furniture* (Amherst: University of Massachusetts Press, 1980) and Thomas Moser's books about Shaker furniture, this volume gives the why, as opposed to the how, that some of us need to enable us to build these worthy original American pieces. Successfully completing Shaker style projects probably requires that we adopt the Shaker mind set—at least in the shop—and no book explains that attitude as well as this beautiful volume.

The Conversion and Seasoning of Wood by William H. Brown, ©1989 (Linden Publishing Co., 3845 North Blackstone, Fresno, CA 93726) 222 pp., paperback, $14.95

While this "highly practical manual for the small timber user" doesn't take us from tree to table, it does take us from the freshly cut log to the shop door. The early chapters cover milling logs into timbers by practical "small" methods, usually chain saw operations. Moisture and shrinkage are covered along with the tools for measuring it. Discussions of kiln and air drying follow, including post–kiln protection and seasoning, and how to avoid drying defects. Although the dangers aren't adequately discussed, and the otherwise excellent photos show none of the chain saw operators wearing face shields or hearing protection, those whose acreage readily affords timber could profit handsomely from this volume. Others, like me, will never again be able to go to our timber merchant without thinking of the possibilities presented here. Were I younger, I'd want acreage, a solar kiln, and the ambition to use them.

You Can Make Money from Your Arts and Crafts by Steve and Cindy Long, ©1988 (Mark Publishing, 15 Camp Evers Lane, Scotts Valley, CA 95066) 231 pp., paperback, $14.95

If there's nowhere you'd rather be than your shop, Steve and Cindy Long's book will appeal to you right from the dedication to "the unemployed, the under–employed, and the unhappily employed." Their premise is that craftspeople who approach their work in a serious, business–like manner, can make $20,000 to $60,000 or more annually. "Oh, I could never do that," you might be murmuring. The Longs reply that there's a difference between gifted and talented—the former means having natural ability, but talent is learned. Take your wares to the shows, and the customers will teach you what you need to know.

About 20% of the book is a pep talk from which all condescension has been banished. Chapters about scheduling and batch sizes follow. Dwelling here on the four P's (product, price, packaging and presentation) would be to steal too much of the Long's thunder. Suffice it to say, their advice is practical, timely, legal, and absolutely certain to stay that way. Craft shows are treated thoroughly, and so are starting a mail order business, wholesaling products, and other means of broadening sales. I've seen no more practical guide.

Projects for the Router by Casey Chaffin and Nick Engler, ©1988 (Sterling Publishing Co., 387 Park Avenue South, New York, NY 10016-8810) 127 pp., $9.95

First published in 1987 as a Grolier Book Club selection, this book brings to a more general audience a collection of projects that should increase the popularity of the router. The trivets here are more handsome than any I've seen; the 19 other projects range from a gumball machine to a kitchen island. Of special interest is the router table that will help you use the router as a shaper, spindle cutter, pin router, and mortiser. The photos and three–color drawings are *exceptional*, the text is spare and to–the–point, and frequent intermissions in the projects share tips that apply to projects of your own design as well as those presented here.

Building Free–Form Furniture by Charles W. Durney, ©1982 (TAB Books, Monterey Lane, Blue Ridge Summit, PA 17214) 209 pp., paperback, $9.95

Rustic would be a suitable synonym for "free–form." In offering us projects for *our* use and modification, Durney reminds us that nature is an excellent teacher. He treats the reader as his equal in the process of designing free–form furniture, even when he is sharing shortcuts that assuredly came via hard work and experience. The book guides us through the construction of coffee tables, sofas, chairs, ottomans, various tables, a mantle, lamps, a grandfather's clock, and many accessories. The writing style remains clear and friendly throughout, and the text is profusely illustrated with easy–to–follow, well–captioned drawings and photos.

Woodworking Projects II by the editors of Sunset Books and Sunset magazine, ©1984 (Lane Publishing Co., Menlo Park, CA 94025) 96 pp., $5.95

About 79 attractive projects are here, arranged by category and, within each category, by level of difficulty or amount of time required. "Household Accessories" include 22 items ranging from napkin rings to a wine rack that will support a gross of bottles (that's 144!) The "Furniture" section opens with an interesting roll–around computer table, complete with customizing ideas. A handsome cantilevered chair, butcher block table, lawn chair, various other tables, and a pair of beds round out this section's 14 projects. There are 16 plans for children's furniture and toys. The half dozen "Hobby and Craft" projects are highlighted by a slick, quick and useful looking "non–pro" workbench, and by an attractive sewing center. The dozen yard and garden accessories feature mainly lamps, planters, and birdhouses—all attractive. Aimed at the weekend woodworker, this book would represent an excellent value at twice its cover price.

***Hugh Foster** is a part-time furniture designer/builder in Manitowoc, Wisconsin and the author of* The Biscuit Joiner Handbook *(Sterling Publishing Co., 387 Park Avenue South, New York, NY 10016).*

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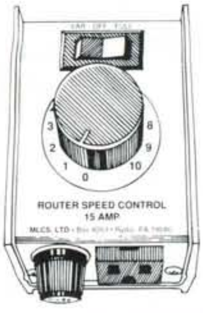

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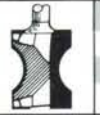
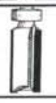
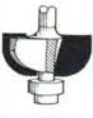
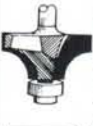
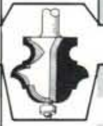
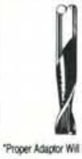
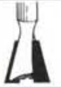
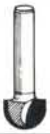
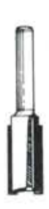
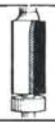
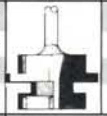
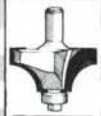
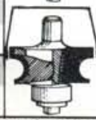
#222		¼" **Fingernail**	¼" Dia. of Circle		½"	¼"	$12.50
#223		⅜" Fingernail	⅜" Dia. of Circle		⅝"	¼"	$13.00
#224		½" Fingernail	½" Dia. of Circle		¾"	¼"	$13.50
#225		⅝" Fingernail	⅝" Dia. of Circle		⅞"	¼"	$14.50
#506		½" **Pattern**	Flush Trim	½"	1"	¼"	$15.00
#507		⅝" Pattern	Flush Trim	⅝"	1"	¼"	$16.00
#508		¾" Pattern	Flush Trim	¾"	1"	¼"	$17.00
#340		⅛" **Cove**	⅛" R	⅝"	½"	¼"	$12.00
#341		¼" Cove	¼" R	1"	½"	¼"	$13.00
#342		⅜" Cove	⅜" R	1¼"	9/16"	¼"	$14.00
#343		½" Cove	½" R	1½"	⅝"	¼"	$15.00
#644		¾" Cove	¾" R	1⅞"	¾"	½"	$28.00
#350		⅛" **Round Over**	⅛" R	¾"	½"	¼"	$11.00
#351		3/16" Round Over	3/16" R	⅞"	½"	¼"	$11.00
#230		¼" Round Over	¼" R	1"	½"	¼"	$12.00
#354		⅜" Round Over	⅜" R	1¼"	⅝"	¼"	$15.50
#355		½" Round Over	½" R	1½"	¾"	¼"	$17.00
#656		¾" Round Over	¾" R	2"	⅞"	½"	$21.00
#657		1" Round Over	1" R	2½"	1"	½"	$33.00
#859		**Multiform Moulding**	Unlimited Patterns	2¼"	2"	½"	$50.00
#601		⅛" **Spiral Cutter**		⅛"	½"	¼"*	$ 9.00
#602		3/16" Spiral Cutter		3/16"	⅝"	¼"*	$12.00
#603		¼" Spiral Cutter		¼"	¾"	¼"	$12.00
#903	**Solid Carbide**	¼" Spiral Cutter		¼"	¾"	½"*	$12.00
#904		⅜" Spiral Cutter		⅜"	1"	½"*	$24.00
#905		½" Spiral Cutter	*Proper Adaptor Will Be Supplied	½"	1½"	½"	$29.00
#402		⅜" **Dovetail**	8 degree For	⅜"	½"	¼"	$12.00
#404		½" Dovetail	8 degree Leigh	½"	13/16"	¼"	$12.00
#708		11/16" Dovetail	8 degree Jigs	11/16"	1"	½"	$14.00

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#415		¼" **Core Box**	round nose	¼"	¼"	¼"	$10.00
#416		⅜" Core Box	round nose	⅜"	⅜"	¼"	$11.00
#417		½" Core Box	round nose	½"	11/32"	¼"	$14.00
#418		¾" Core Box	round nose	¾"	⅝"	¼"	$15.00
#719		1" Core Box	round nose	1"	¾"	½"	$18.00
#470		¼" **Straight**	plunge cutting	¼"	¾"	¼"	$ 7.00
#471		5/16" Straight	plunge cutting	5/16"	1"	¼"	$ 7.00
#472		⅜" Straight	plunge cutting	⅜"	1"	¼"	$ 7.00
#473		7/16" Straight	plunge cutting	7/16"	1"	¼"	$ 7.00
#474		½" Straight	plunge cutting	½"	1"	¼"	$ 7.00
#775		½" Straight	plunge cutting	½"	2"	½"	$14.00
#476		9/16" Straight	plunge cutting	9/16"	1"	¼"	$ 7.00
#478		⅝" Straight	plunge cutting	⅝"	1"	¼"	$ 8.00
#479		¾" Straight	plunge cutting	¾"	1"	¼"	$10.00
#500		⅜" **Flush**	**Trimming**	⅜"	½"	¼"	$ 7.00
#502		½" Flush	Trimming	½"	½"	¼"	$ 7.50
#503		½" Flush	Trimming	½"	1"	¼"	$ 8.50
#804		½" Flush	Trimming	½"	1 3/16"	½"	$ 9.00
#545		**Tongue & Groove**	Straight	1⅝"	1"	¼"	$29.00
#845		Tongue & Groove	Straight	1⅝"	1"	½"	$29.00
#546		Tongue & Groove	Wedge	1 3/16"	1"	¼"	$29.00
#846		Tongue & Groove	Wedge	1⅝"	1"	½"	$29.00
#450		⅛" **Beading**	⅛" R	¾"	½"	¼"	$11.00
#451		3/16" Beading	3/16" R	⅞"	½"	¼"	$11.00
#233		¼" Beading	¼" R	1"	½"	¼"	$13.00
#453		5/16" Beading	5/16" R	1⅛"	½"	¼"	$14.00
#454		⅜" Beading	⅜" R	1¼"	⅝"	¼"	$15.50
#455		½" Beading	½" R	1½"	¾"	¼"	$17.00
#530		3/16" **Edge Beading**	3/16" Dia. of Circle	1 1/2"	5/8"	¼"	$15.00
#531		5/16" Edge Beading	5/16" Dia. of Circle	1 7/8"	7/8"	¼"	$15.50

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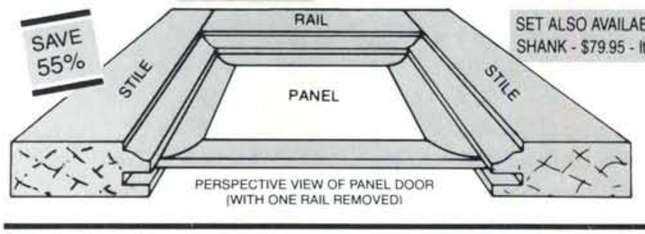

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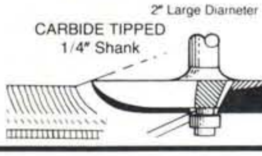

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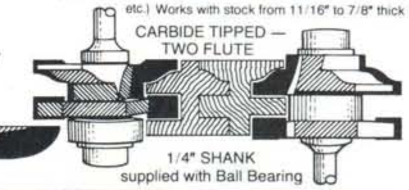

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Videoscene

by Alan Marks

Sam Maloof: Woodworking Profile directed by Rick Mastelli, ©1989 by The Taunton Press, Box 06470-5506, Newtown, CT 06470, 60 min., $29.95.

As most craftspeople know, Sam Maloof has become something of an American woodworking institution. It might even be safe to call him our country's most acclaimed woodworker. Talented, gregarious, prolific, generous with his time and magnanimous in his acceptance of approaches to craft which vary from his, it is no wonder he has established such a visible profile.

Taunton takes a step in a new direction with the publication of this video because its emphasis is by no means entirely instructive. This is not to say that a woodworker might not learn new approaches and techniques from seeing Sam in action; he probably would. But it is obvious that the camera crew which followed him about recorded in an impromptu fashion. In contrast, tapes in the "workshop" series by Taunton are painstakingly staged and immaculately directed.

Ominously enough, this one opens with a disclaimer of liability if anyone attempts to emulate Maloof's techniques and suffers an accident. I can't recall seeing a disclaimer on a Taunton video before, but, at least in this case, it appears justified. You'll see some scary things. Sam learned how to do them all by himself. In his defense, though, he still has all his fingers, and he's the first to admit that he takes calculated risks.

The tape seems unclear in its goals. The publisher calls it a "profile," but I know Sam, and in my opinion the tape doesn't really capture his personality. Despite the fact that much of it is overdubbed with Sam's ramblings about his work ethic, about building his home in Alta Loma, his love of crafts objects, and so on, there is plenty of room left for someone to produce a really good portrait of Sam Maloof.

The tape misses a lot. For example, I recall his telling me that he worked as a commercial artist before he turned to wood, and that the first impetus for making furniture was totally unrelated to any professional aspirations. He and his new wife Alfreda simply could not afford to buy any. The wood for them was salvaged from someplace. His actual career began when a visitor to the house admired the new furniture and showed interest. His workshop started out as a converted chicken coop, as I recall. It would be foolish for anyone aspiring to do a good documentary on Sam to omit mention of these humble beginnings. It would be as foolish for any biographer of Abraham Lincoln's to leave out any reference to the log cabin in which he grew up.

Some people find Sam ingenuous. I honestly believe he stands in awe of all the positive things that have happened to him during his life. Since he can't quite believe his good fortune, he makes it seem more real by sharing it with everyone.

You'll see Maloof working in his shop, explaining some of his methods; this comprises perhaps sixty percent of the tape. At least some of the spotty information will be of use. Some is out of context and some is unclear (at least to me). Most interesting to me is the method Sam uses to shape and glue up his solid seats. Don't, however, expect to be able to build a chair, or any other piece of Maloof furniture, from the information in this tape.

Tips From 17 Taunton Video Workshops, ©1989, The Taunton Press, Box 06470-5506, Newtown, CT 06470, 50 min., $5.00 (refundable from first video purchase from Taunton)

Tips? Really? More like a sampler, or a potpourri. This video essentially previews, in the space of its fifty minutes, the contents of seventeen other Taunton tapes. It is a sampling for interested parties who might want see a portion of the actual tape instead of just reading about it in the manufacturer's catalog.

This is the way the setup works: Buy this tape for five dollars and you get a coupon worth five dollars toward any one of the tapes in the series. The coupon amount will be deducted from your purchase price. There is no complete information about any subject provided in this video. So, by and large, this is a promotional tape. Essentially you are paying for the advantage of making a more informed decision about which tape or tapes, if any, you wish to buy.

Another way you can acquire a Taunton tape is to rent it. For $9.95 you can rent any tape for ten days. If you decide to buy it that money is deductible from the purchase cost. Guess you'd call that a "rental with option to buy".

I have viewed the vast majority, if not all of, the woodworking videos available in this country during the course of my several years as a reviewer for this magazine; in my assessment, Taunton maintains a standard of excellence unparalleled by other publishers in the field.

Outdoor Furniture, with Steve Borton and Terrie Lee Hysell, ©1989 by The Stanley Works, Box 1800 Outdoor Projects, Dept. OPB, New Britain, CT 06050, 40 min., $14.95

Some time ago Stanley published a tape on how to build an armoire (reviewed in this column in *PW*#49, June/July 1989). This seems to be the latest addition to the series; it comes bundled with a folder called "Outdoor Projects." If you want to build the gazebo shown on the cover of the folder, you must rely on plans and written instructions alone. Only outdoor furniture is covered by the video.

There are two similar styles of outdoor furniture to choose from. One is Litchfield furniture, the more easily constructed of the two, and the other is Galway. You can choose to build adaptations of either or both. There are plans for a chair, a small bench, and a coffee table in each style and for a planter in the Litchfield style.

It is possible to build the furniture without any power tools, though battery–powered drills and screwdrivers certainly do speed things up. The drawings are clear and complete, as are the materials lists. The Litchfield furniture gets assembled with screws and the Galway hangs together with mortise and tenon joints.

It seems to me that the tape does a good job, and despite the commercial overtones, I recommend it. The advertising hype didn't bother me that much, and, on the plus side, it even mentions a newly designed Stanley hand saw that I'd like to try out. PW

***Alan Marks** is a cabinetmaker in Carmel Valley, California, and a contributing editor to* PW.

Tried and True

by Graham Blackburn

Shaves and Drawknives

In the beginning, a cutting edge was used simply by striking, like the axe or adze. Then came a more controlled use of the sharp edge—for cutting or slicing. Over the centuries, we have developed ever more sophisticated ways of using the sharp edge, from enclosing it in a device to control the cutting action, to propelling it by forces other than the unaided hand. The common spokeshave occupies a central position between these two main classes of handtools—the older naked–blade type and the newer enclosed–edge variety.

Belonging to the naked–blade class is the drawknife, an ancient tool whose varieties are legion. All share one feature—a simple cutting edge held by a handle at each end. Spokeshaves today are direct descendants of the drawknife, linking them to the enclosed–edge tool typified by the plane. Like the drawknife, they exist in an almost numberless variety. Between them these two tool types comprise one of the largest classes of woodworking implements, and include tools that are a curious combination of both, such as the scorp and the inshave. Listing a few of the varieties—travishers, buzz, barrel shave, bent shave, bottle shave, jarvis shave, swift, downright, nelson, jigger, heading knife, crumming knife, hoop maker's drawing knife, howeling drawing knife—suggests the huge diversity that such an apparently simple tool has achieved. I'll discuss the major varieties and, most important, how they relate to tools we might find useful today.

Drawknives

Drawknives were employed by the Vikings in shipbuilding. The first known Western European examples didn't show up until late in the seventeenth century, when carpenters and coopers eagerly adopted it. By the mid–eighteenth century there were dozens of types in use by a score of woodworking trades from coachbuilders to wainwrights. Though woodworking today is mainly carpentry and furnituremaking, good tool catalogs still list several types of drawknife, each for a specialized use.

The innumerable varieties differ largely in the shape of the blade. Perhaps the most basic form is a flat or slightly curved blade 12" to 18" long and worn down by repeated sharpening to about 2" wide. The front is ground to a beveled edge like a chisel—flat on the back—and the blade ends are formed into tangs which are inserted into handles and bent up at various angles from the blade itself (see Figure 1 below).

Drawknife Uses

Apart from the many highly specialized uses developed over the years, most are used either for rough shaping or for curved work such as barrel making. Coopers probably accounted for half the drawknives sold in nineteenth century catalogs. Many old cooper's shaves are ideally suited to certain aspects of contemporary furniture making, particularly where non–rectilinear designs are concerned.

Preliminary shaping tools fall into two groups—those with curved and those with straight blades. The "American pattern" drawknife is the commonest of the former group and is still the most often offered for sale. The blade, from 8" to 14" long, curves toward you, and unlike almost every other type of drawknife, is ground in a single bevel from the front cutting edge to its back (Figure 1). Its handles are usually splayed outwards rather than set at closer than 90° to the blade. It's relatively easy to use, and cuts best with a skewed slicing action rather than straight on. It can accurately pare and reduce stock to a line, and is ideal for wasting material from a corner block or interior framing piece, especially after

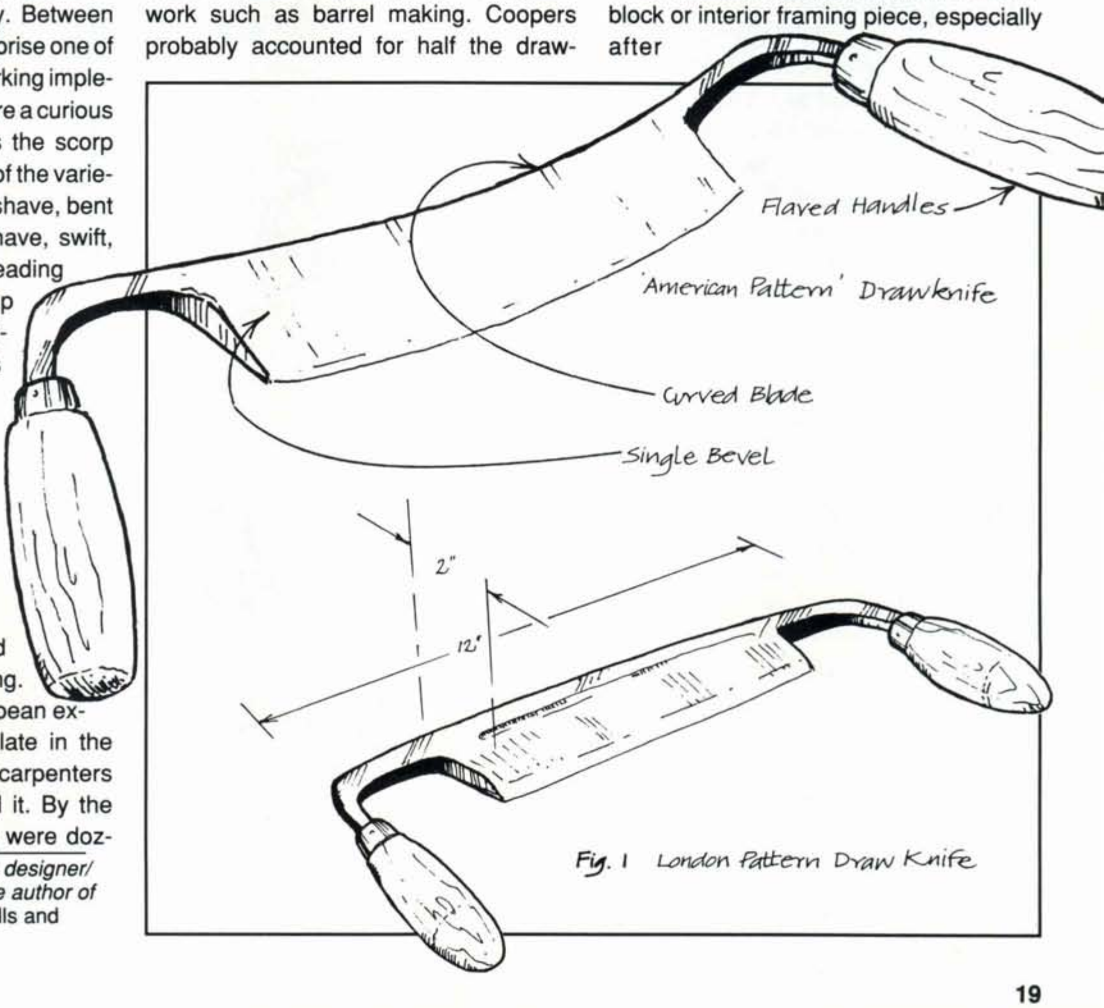


Fig. 1 London Pattern Draw Knife

***Graham Blackburn** is a furniture designer/maker in Aptos, California and the author of many books including* Floors, Walls and Ceilings.

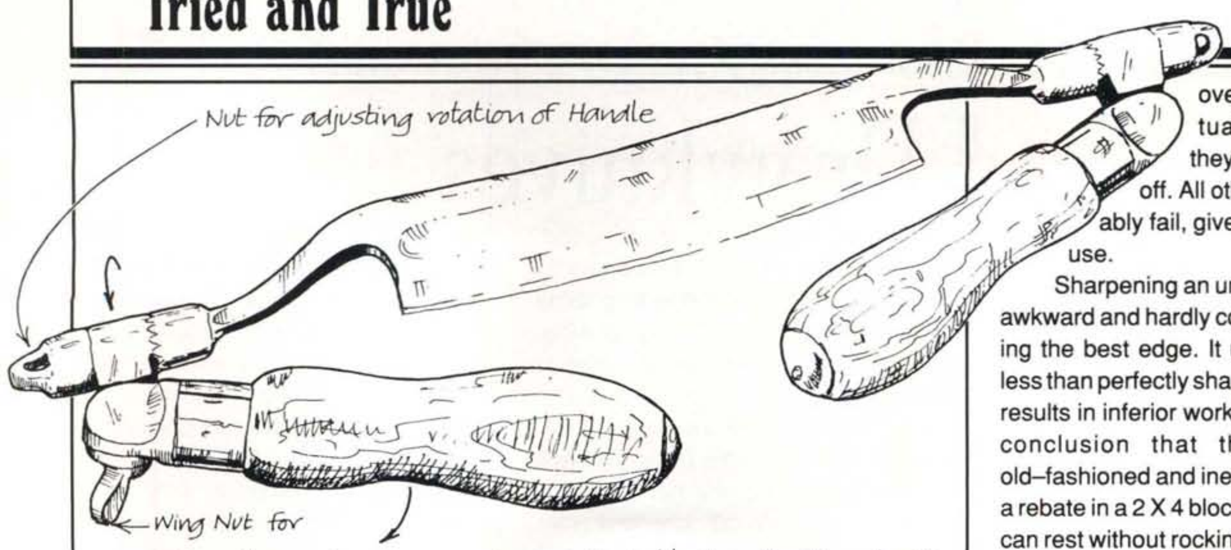

Nut for adjusting rotation of Handle
Wing Nut for adjusting splay of Handle

Fig. 2 Adjustable Handle Drawknife

assembly, when the piece can't be taken to the table saw or bench vise.

As the name implies, the drawknife was originally intended to be pulled towards you, the work being held between a fixed support and your chest, or clamped in a shaving horse. Its lack of any built–in guidance is not the obstacle to accuracy you might think. I remember watching old–time woodworkers using the drawknife almost as if it were a plane, cutting as evenly and closely to the line as most of us can manage with all sorts of jigs and fences! Nevertheless, its best use today is for quickly removing a lot of material. Thus it's better to choose a model with handles that slope downward rather than project out in the same plane as the blade. This form encourages a "greedy" cut.

Other forms of drawknife, with straight blade of various length and width, can be useful, but the best all–purpose drawknife has adjustable handles (Figure 2 above). They can be rotated with respect to the plane of the blade, and with respect to the angle at which they hold the blade. When not in use, the handles can be rotated all the way inwards to protect the cutting edge.

Selecting a superior–handled tool and sharpening it efficiently are not always easy. The best method of handling consists of tangs inserted completely through the wood handle and formed into a riveted head over a metal plate, virtually guaranteeing they'll never be pulled off. All other methods invariably fail, given enough time and use.

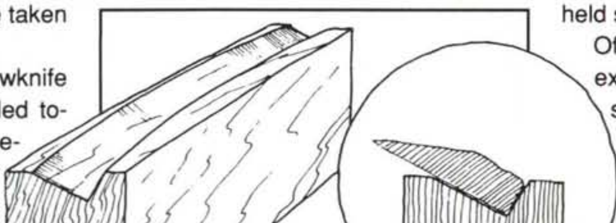

Make Retate in 2×4 to match curve of Blade

Fig. 3 Drawknife Sharpening Block

Sharpening an unsupported blade is awkward and hardly conducive to producing the best edge. It usually results in a less than perfectly sharp tool, which in turn results in inferior work and the erroneous conclusion that the drawknife is old–fashioned and inefficient. Carving out a rebate in a 2 X 4 block in which the blade can rest without rocking is a good solution (Figure 3). The drawknife can then be firmly clamped to the block, which can be held securely in the bench vise.

Of all the odd shapes and varieties that exist, there are two which deserve consideration by today's custom woodworker—the inshave and the scorp (Figure 4 below). Originally cooper's tools used for shaping the interior of barrels, both are valuable wherever there is any scooping or hollowing work to be done, such as for chair seats.

Spokeshaves

At one time, only tools intended for shaping wagon wheel spokes were referred to as spokeshaves. But since tools

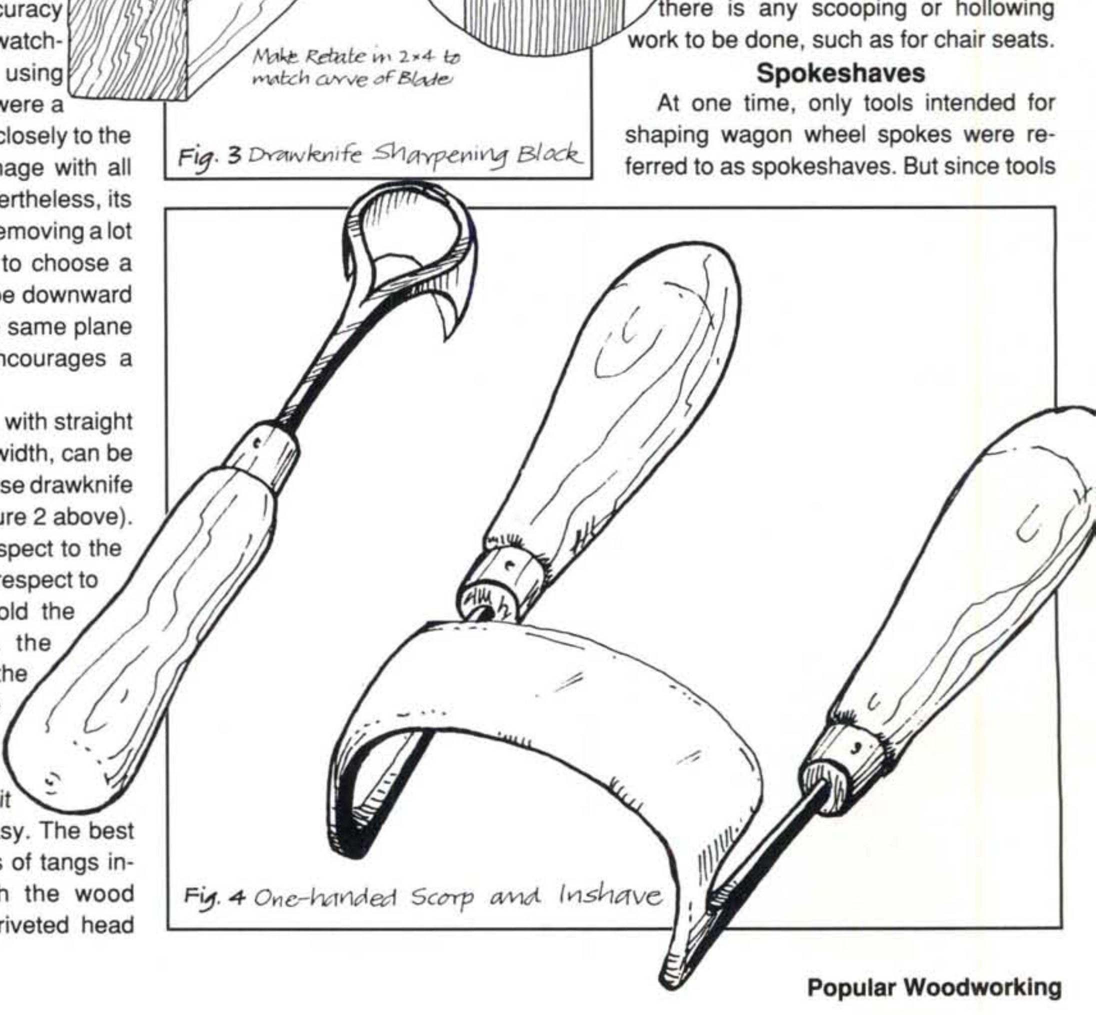


Fig. 4 One-handed Scorp and Inshave

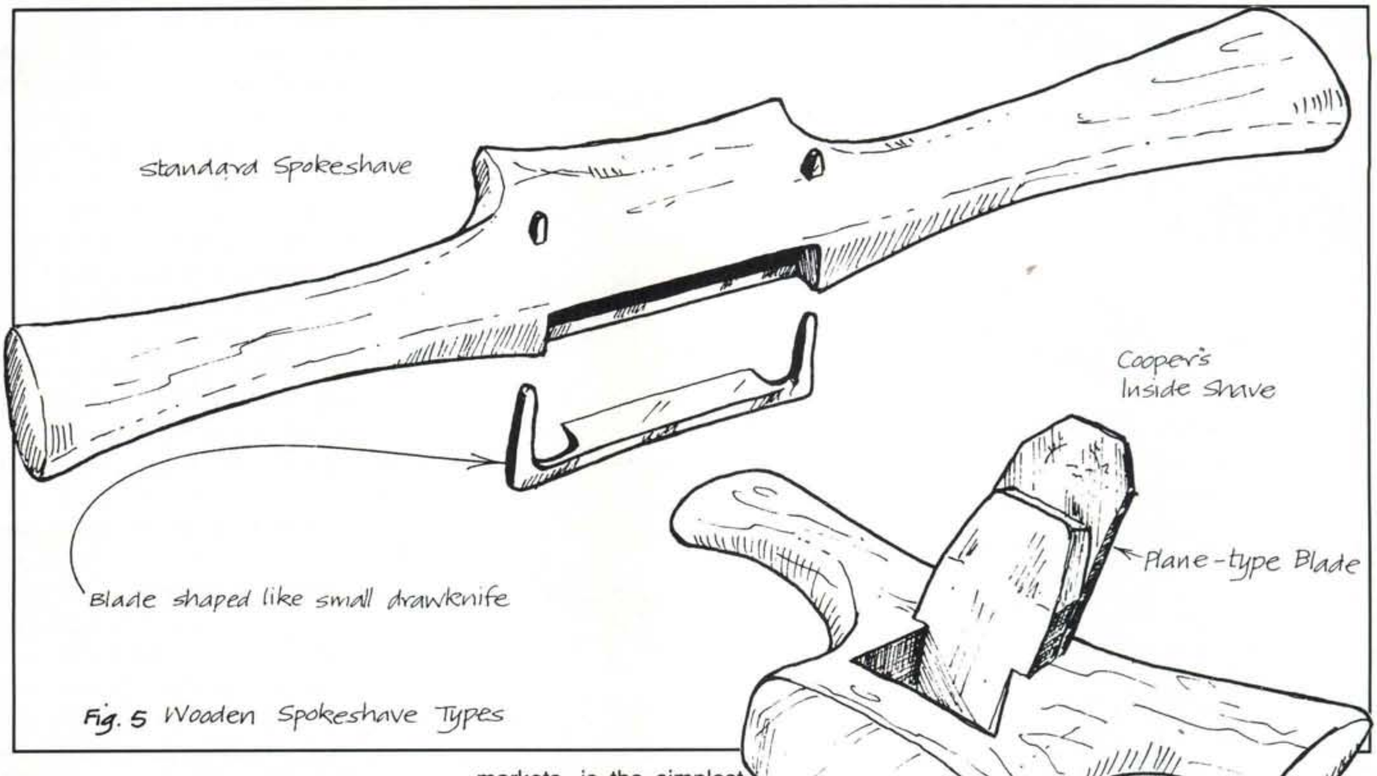


Fig. 5 Wooden Spokeshave Types

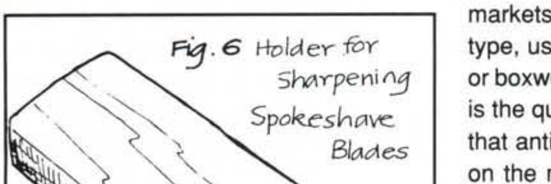


Fig. 6 Holder for Sharpening Spokeshave Blades

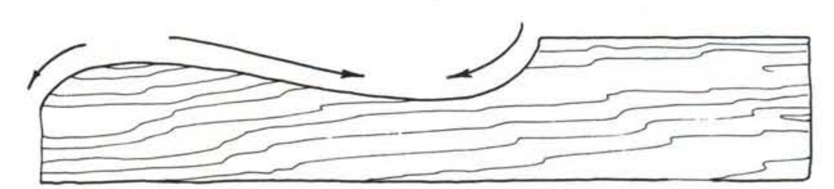
with a transverse blade mounted in a metal or wood stock and provided with handles at each end are all shaves—including the drawknife—it's convenient to refer to their smaller cousins—the enclosed edge type with stocks—as spokeshaves. Before the introduction of metallic spokeshaves in the last century, all such tools could be divided into two main groups: those with blades formed like miniature drawknives, the tangs of which held the blade in the handled wooden stock, and those with blades like miniature plane irons, held in the handled wooden stock with a wedge, just like plane irons in wooden planes (Figure 5).

The former, long the standard and still common in antique shops and flea-markets, is the simplest type, usually made of beech or boxwood. Despite the fact that it is the quintessential "old tool," perfect for that antique look in your toolbox or even on the mantel, it is—in contrast to most other "tried and true" tools—difficult to recommend. Because such a small area of the wooden stock contacts the work, it's quickly worn—as evidenced by the great many examples fitted with brass wear plates—and the iron is difficult to adjust. These facts can result in a jumping, chattering tool that takes either too large or too small a cut. The blade design leaves little margin for repeated sharpenings—quite apart from the fact that sharpening at all is very difficult without making some kind of miniature holding jig. The blade is soon worn away past the point at which the ends of the blade are formed into the holding tangs. Better models were made with various methods of adjusting blade depth by screws on the tangs, but the introduction of the modern type is one of those rare instances of genuine progress with no loss of application in exchange for the ease of use gained.

Metallic Spokeshaves

Though metal–bodied spokeshaves may break when dropped on hard floors, it's a small price to pay considering their mouths don't get larger with use and their blades are much more easily adjusted. Early types held the blade in place by a single screw through a plane–type cap iron, but later models have almost universally adopted two adjusting screws, which

Fig. 7 Direction from which Spokeshave must be used in order to avoid Contrary Grain



illustrations by Graham Blackburn

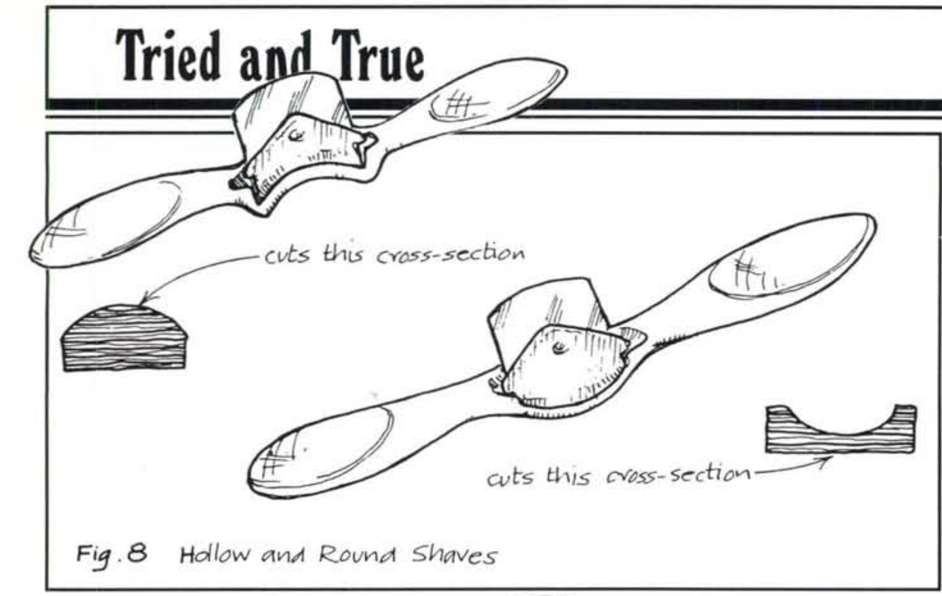


Fig. 8 Hollow and Round Shaves

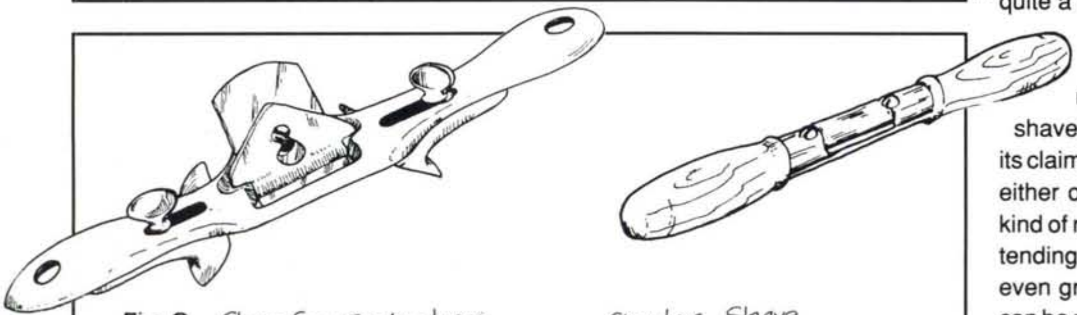


Fig. 9 Chamfer Spokeshave

Circular Shave

Illustrations by Graham Blackburn

makes alignment as well as blade depth easy to set.

Sharpening the small iron is like sharpening any plane iron, but is considerably easier if you make a wooden holder (Figure 6 on the previous page). Keeping a very sharp iron and a small mouth are the secrets to using this tool. Because of the tasks it's intended for, you're always running into contrary grain (Figure 7), and reversing direction is often easier said than done. It's better to adjust the tool so that you can make a thinner cut with an extremely sharp blade. If the work permits, use it at an angle—as if the iron were skewed in the tool—but with spokeshaves made with specially shaped soles for cutting anything other than a flat section, this is not possible.

The type just mentioned with hollowed or rounded soles (Figure 8) are designed for forming rungs and curved chair parts. Another variety made with the sole rounded from front to back, sometimes referred to as circular shaves, are useful if you must work the tool in a very tight radius (Figure 9), but otherwise aren't as handy as flat soled models. It's difficult to keep a round soled tool's blade in constant, even contact with curving work.

A variety appearing about a century ago and recently reintroduced is the adjustable chamfer spokeshave (Figure 9). It's often more convenient than a router with a chamfer bit, being easily adjusted for any width chamfer up to an inch and a half, and perfectly safe and quiet into the bargain. For larger scale work—post and beam houses, for example—there's a similar idea applicable to drawknives. This consists of a pair of adjustable attachments that can be fixed to the drawknife blade to produce a kind of giant chamfer spokeshave.

One last variety—the universal shave (Figure 10)—deserves mention, although it's no longer made and can command quite a high price because of the interest of collectors in all things Stanley®. Apart from its uniqueness in the world of metallic spokeshaves by virture of its wooden handles, its claim to fame lies in the removeability of either of these handles and its use as a kind of rebate spokeshave—the blade extending right up to the edge of the sole. For even greater convenience, either handle can be reattached at ninety degrees to the standard angle, providing greater control in tight corners. Moreover, as originally sold, it was provided with two interchangeable soles—round and flat—together with an adjustable mini–fence. If you find a universal spokeshave, even one missing the optional attachments, purchase it; this tool is still to be treasured as the apex of the spokeshave maker's art. **PW**

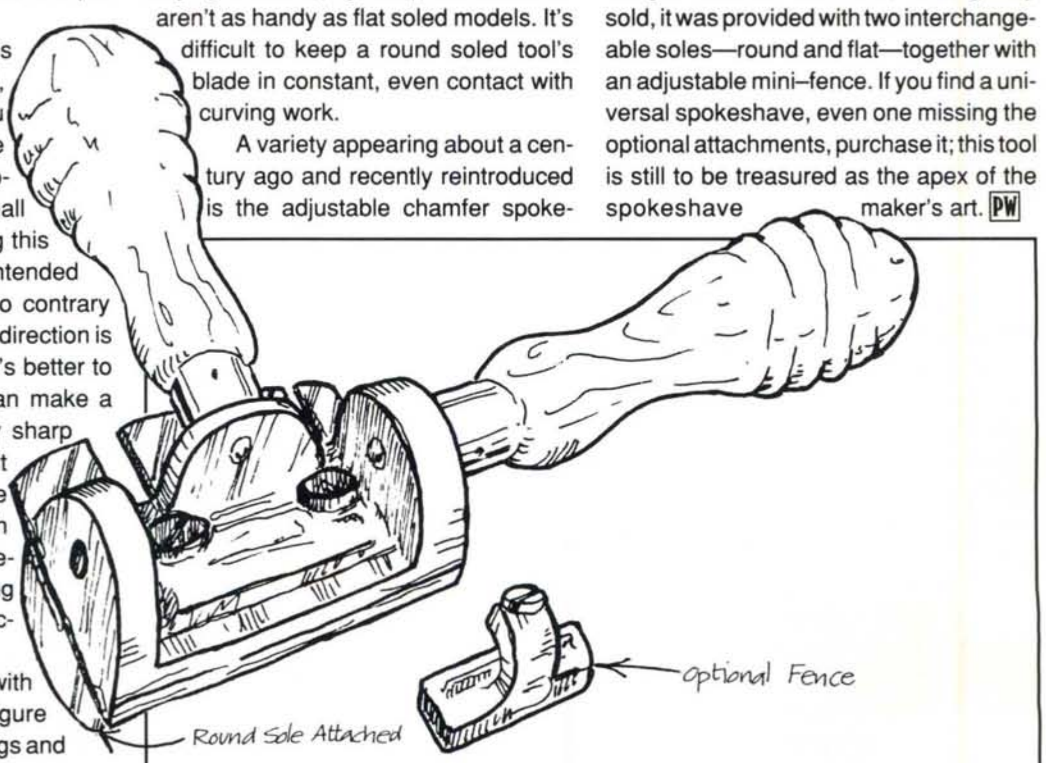


Fig. 10 Universal Spokeshave

Project for the Shop

Centering Tools

by Don Kinnaman

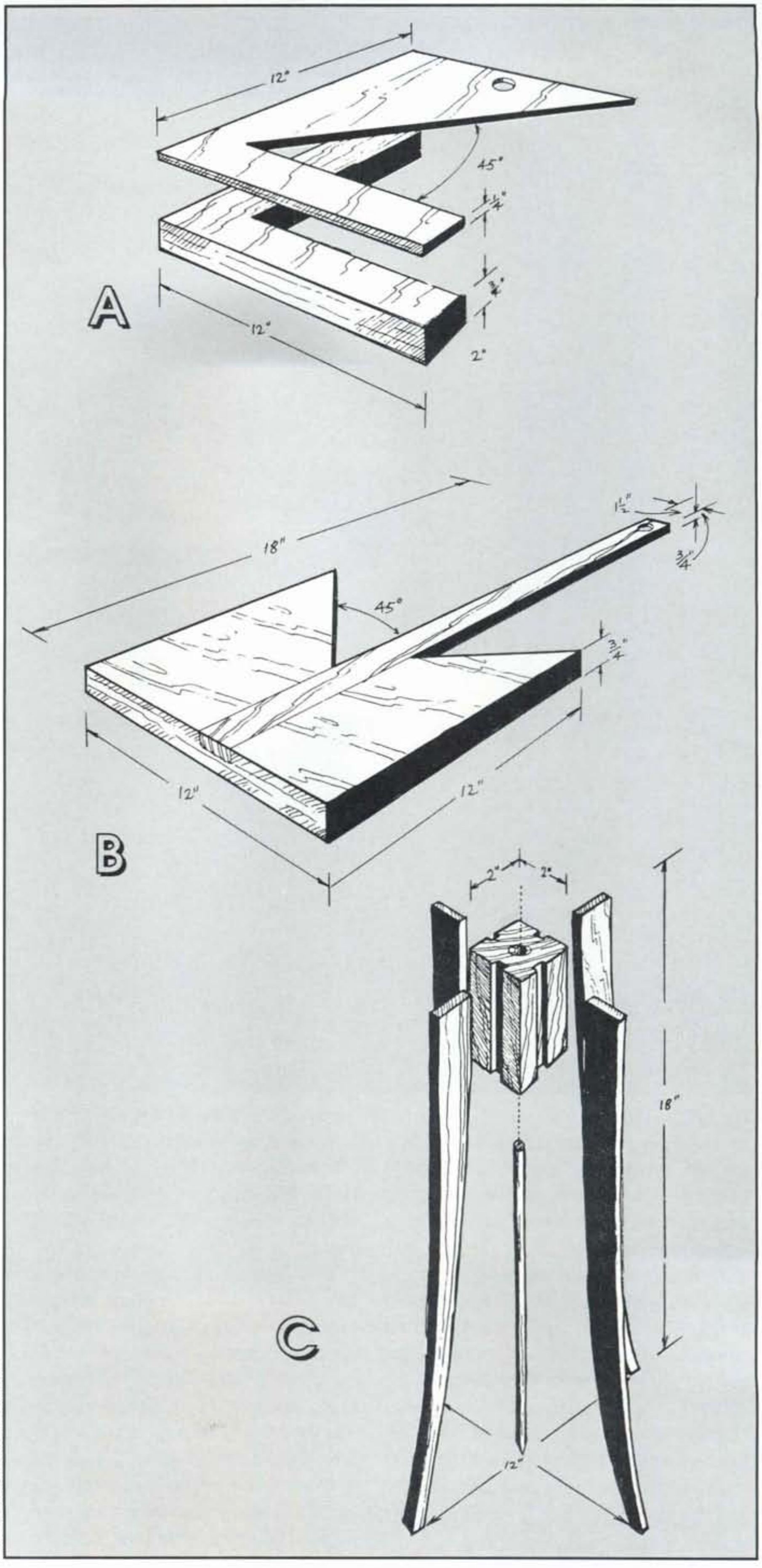
Here are three designs for devices to locate and mark the centers of round objects. Tools A and B work the same way but are made differently. To make A, start with a piece of good quality plywood that is 1/4" X 12" X 12". Carefully lay out and cut the 45° diagonal from one corner down to the 2" leg as shown. (For best results, use a table saw with the blade raised to full height.) Now cut out the L–shaped base from some 3/4" X 12" X 12" plywood making certain that everything is perfectly square. Glue and screw the two pieces together, bore a hanging hole, and apply a coat of finish.

The other version of this tool (B) starts with a 12" X 12" piece of 3/4" plywood. Lay out a line dead center along its length, and cut a dado the size of your centering stick on the right or left side of the line so that one edge of the channel is on dead center. Lay out and cut a perfect 90° set of diagonals that are bisected by the dead center mark, then install the centering stick.

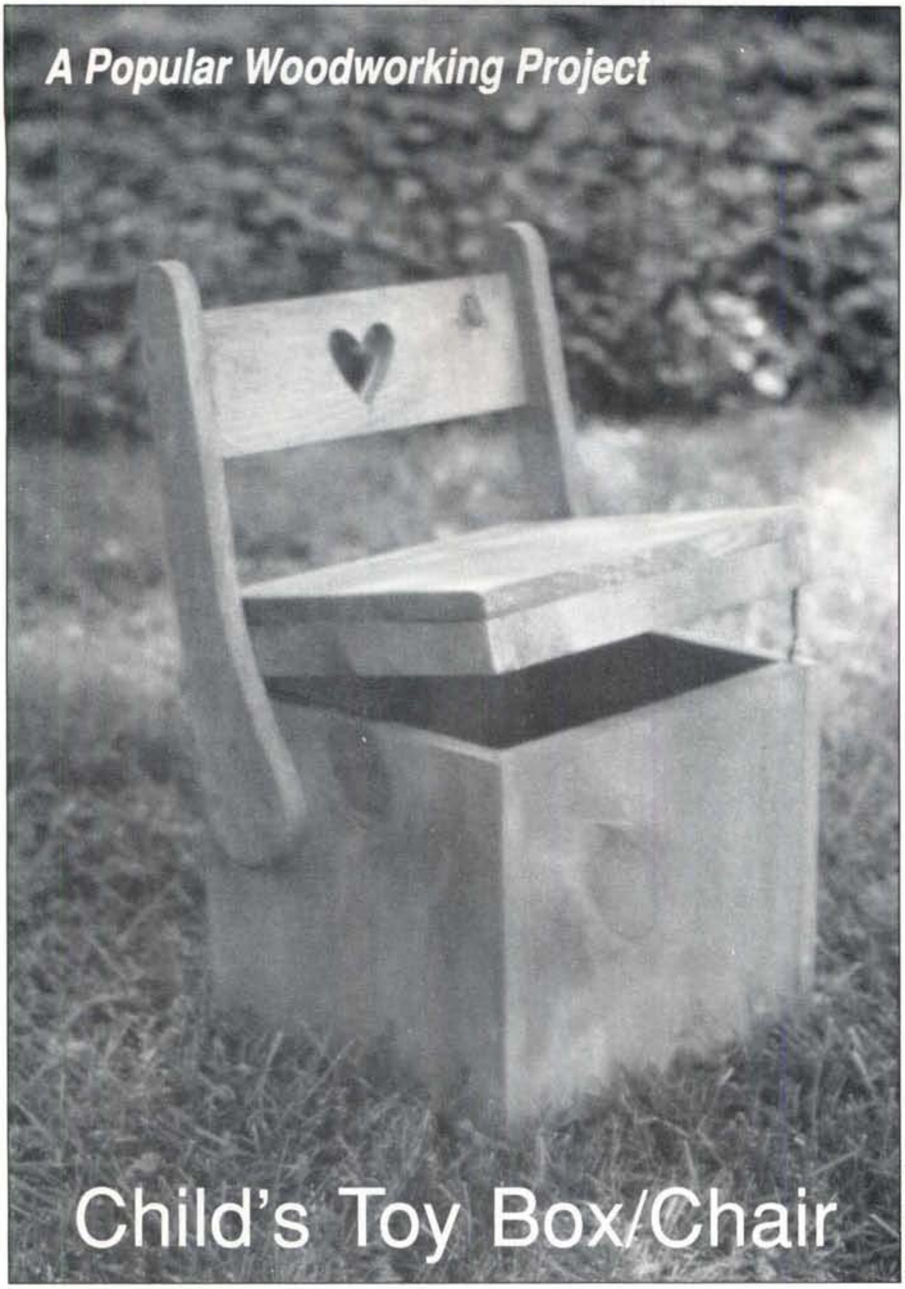
To check the accuracy of these two tools, use them to scribe three lines across the end of a tin can from different angles. Hold the thick portion against the side of the can like you would the stock of a square, and mark along the "blade." All three lines should cross at the same point.

The third centering tool (C) is sort of a big funnel (in fact, a metal funnel of good size will work the same way). Cut a 4" to 6" long piece of 2 X 2 stock as shown. Cut a centered slot on each of the four sides for the legs. Make four matching curved legs from a 6" X 18" piece of plywood so that they taper outward at the bottom as shown. Before assembling, draw diagonals from corner to corner on the end of the block and use a drill press to bore a 1/4" hole through the center. Glue the legs to the block and fashion a long 1/4" rod with a point on the end. To use the tool, slip the legs down over your round object and tap the rod to mark the center. PW

__Don Kinnaman__ is a retired high school woodshop teacher from Phoenix, AZ.



illustrations by Graham Blackburn



A Popular Woodworking Project

Child's Toy Box/Chair

photo by the author

by Stan Fox

Here's a child's chair that doubles as a toy box. It makes an excellent gift, takes only a few hours to complete, and if you use common pine the total cost shouldn't exceed ten dollars.

Starting with eight feet of 1 X 12 stock, cut four pieces, each 11-3/4" long, for the sides (A) of the toy box. From the same stock cut the seat (B) 12-3/4" long, and the bottom (C) 9-3/4" long. The waste will be minimal since you're using the dimensions of the board as it comes from the lumber yard. With glue and 1-1/2" finishing nails, fasten the front and back pieces between the sides as shown in Figure 1. Use five nails on each joint, with the topmost nails only 1/2" down from the top edge. This last point is important since it will help keep the lid intact, as you'll soon see.

Put glue around the edges of the bottom piece, insert it, and nail through the four sides while holding it flush with the bottom edges. Use three nails on each surface. To help you hold the bottom in place while fastening, drive a nail partway into the outside surface of the bottom before you apply the glue. You now have something to grasp to help maneuver the piece into place. Glue on the seat and nail it down through each corner. Center a nail along each edge, too. Countersink all the nails for finishing later. Sand the box at this point in order to counter any slight misalignments that may have occurred during assembly.

With the blade about 1" high, slice the top of the box off in four cuts. To do this, set the fence on your table saw 2-3/16" from the blade (be sure this position clears any nails). Push the box through carefully and slowly; any undue twisting or pressing on the bottom may cause the blade to bind or to chip the wood at the corners. Bear in mind that at the beginning and end of each cut you are slicing through a greater thickness. You now have a perfectly fitting lid, and it's clear why the topmost nails fastening the sides to the front and back had to be positioned so near the top edge. Hold

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__Stan Fox__ has designed and built a number of wooden items for children in his shop in Rockville Centre, New York.

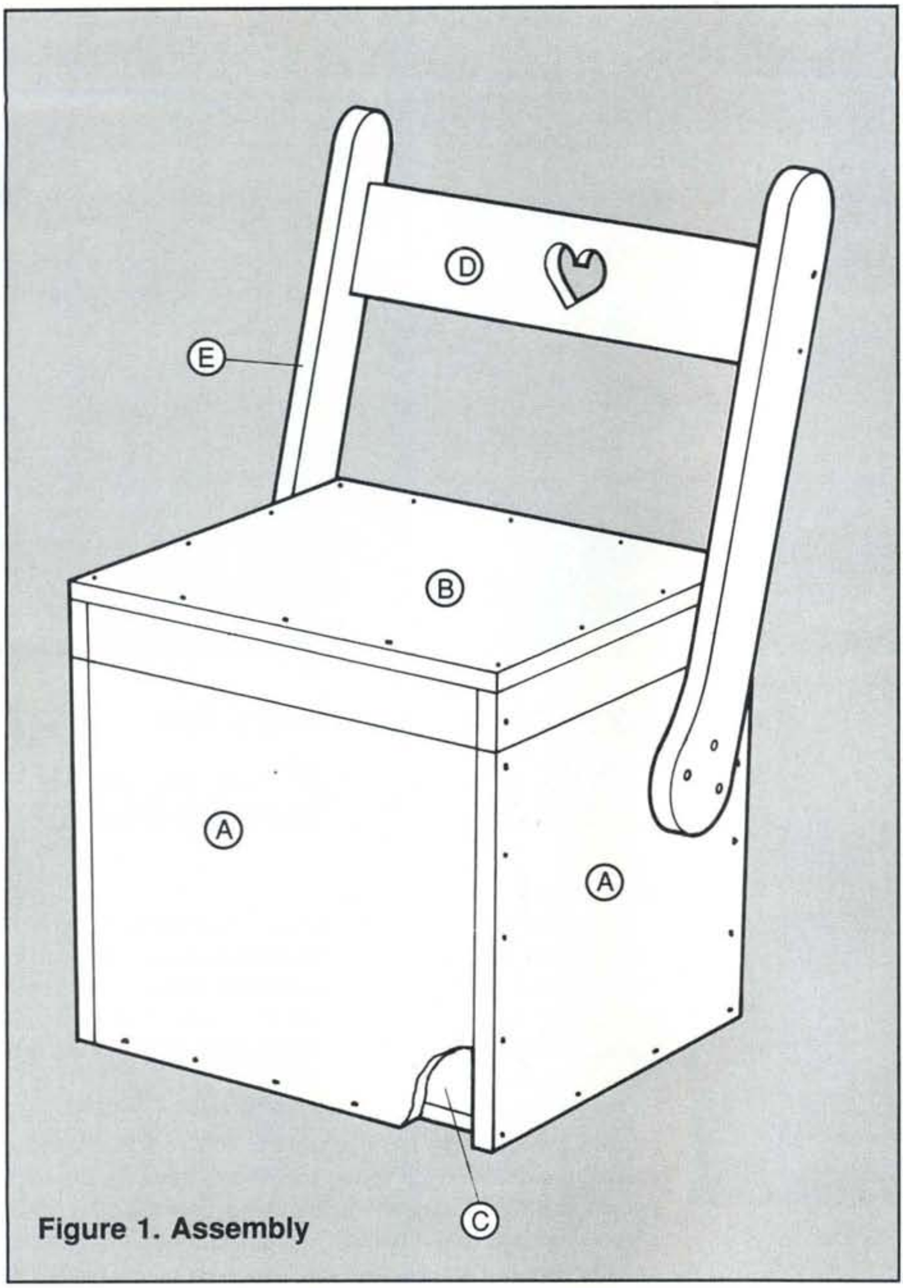


Figure 1. Assembly

Illustrations by Tom Larson

Toy Box/Chair					
Cutting List					
		Finished Size			
Qty	Part	T	W	L	Piece
4	A	$\frac{3}{4}$"	$11\frac{1}{4}$"	$11\frac{3}{4}$"	sides
1	B	$\frac{3}{4}$"	$11\frac{1}{4}$"	$12\frac{3}{4}$"	seats
1	C	$\frac{3}{4}$"	$11\frac{1}{4}$"	$9\frac{3}{4}$"	bottom
1	D	$\frac{3}{4}$"	4"	$12\frac{3}{4}$"	backrest
2	E	$\frac{3}{4}$"	$3\frac{1}{4}$"	$16\frac{3}{16}$"	backrest supports

Supplies	
10	#8 X $1\frac{1}{4}$" flat head wood screws
40	$1\frac{1}{2}$" finish nails
2	$1\frac{1}{2}$" wide flat hinges with screws

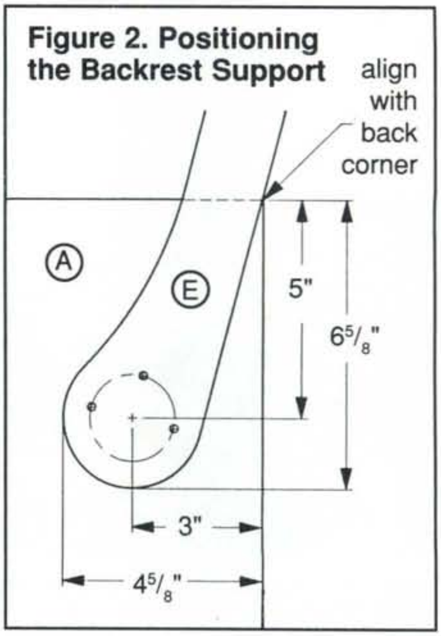
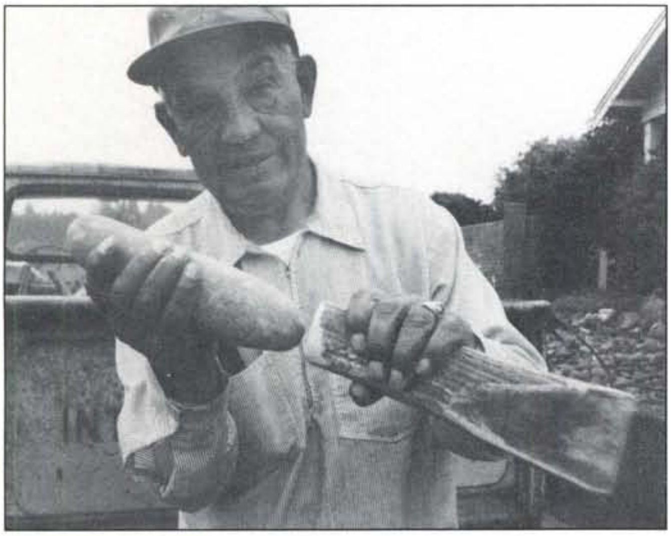


Figure 2. Positioning the Backrest Support

the lid on with masking tape while fastening two flat hinges to the back, 2" from the side edges.

Cut the backrest (D) to size. In the center you can trace and cut with jig, sabre or coping saw a simple design such as a heart or star, or perhaps the initial of the youngster who will use it. Make the two backrest supports (E) using the full–size pattern in the PullOut™ Plans section of the magazine. Bore three holes in the lower end of each support, and two in the upper end. Since you'll be using #8, 1-1/4" flat head wood screws, use a #11 twist drill and then countersink each hole. Be sure to place the screw holes so that you end up with both a left– and a right–hand piece, not two identical pieces. To ensure this result, hold the pieces together and then mark the hole locations on the outside of each. Next, attach the backrest between the supports, near the top, flush with the back edges of the supports; then glue and screw. Glue and screw this assembly to the box with the supports positioned as shown in Figure 2.

Finish off all countersunk holes with wood filler, or you can use wood plugs to cover the screw holes. Then sand and finish as you like. The proportions of the completed project are so designed that when the youngster opens the lid and rests it against the backrest, it will stay open without a supporting arm. I suggest not placing a latch on the lid so that Junior won't be tempted to lock Fido inside. PW



Top—Axel Lindgren and his family by the hand–carved canoe. Above, Axel holds the traditional carving tools—stone and elk antler wedge. Below left, the carved nose and bridge across the bow are shown. In the center, Axel carves out the paddler's seat with a modern adze. To the right, the newly finished vessel is ceremonially "purified.

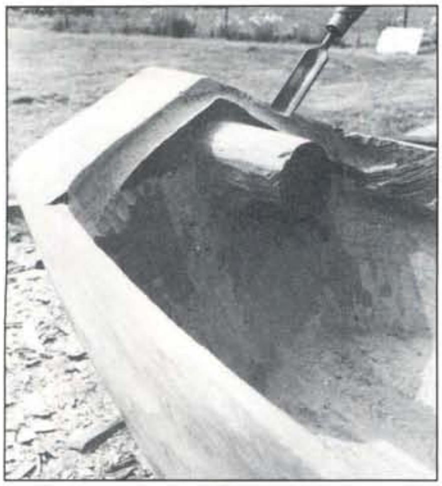
Axel Lindgren Builds the

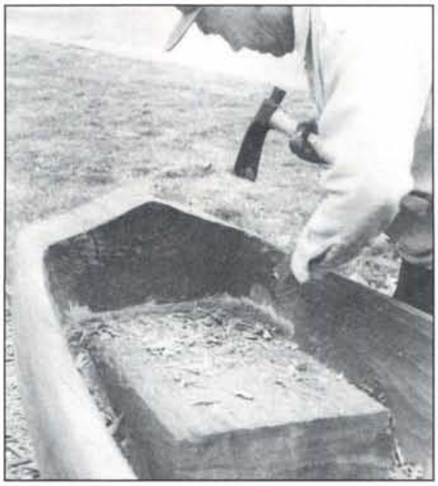
Yurok Canoe

by Deborah R. Upshaw

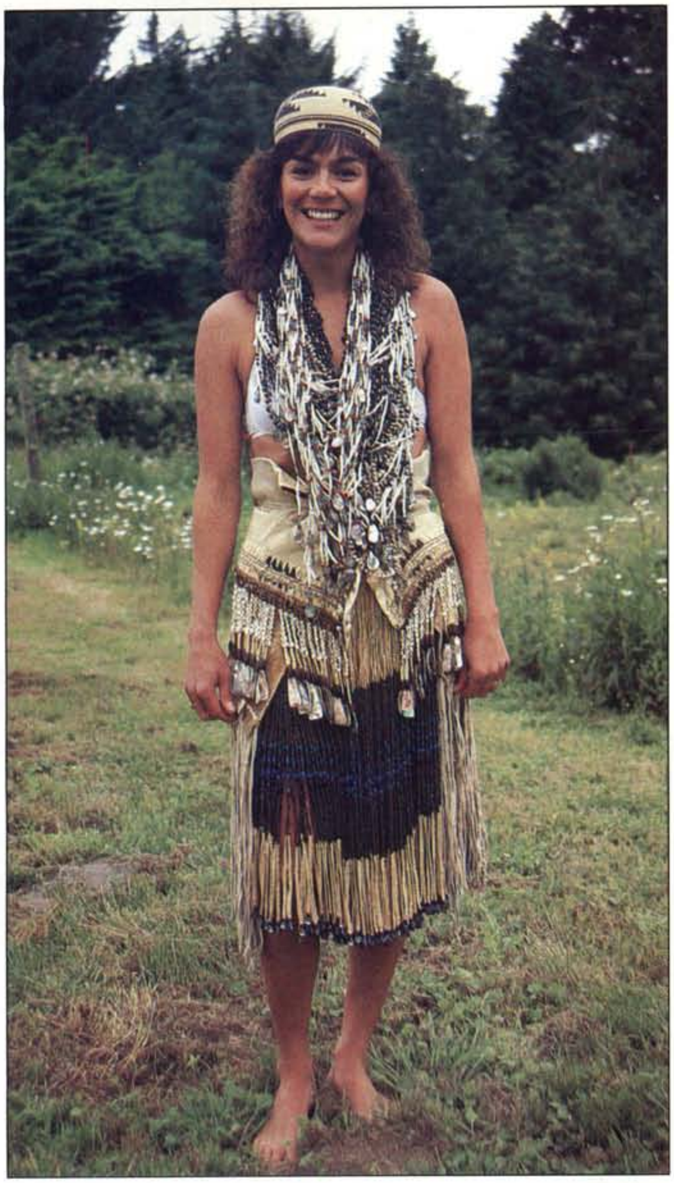
For centuries, Native Americans living along the coastal redwood belt of northern California made and used redwood log canoes for hunting, fishing, transportation, and ceremonial purposes. The Yurok, the Tolowa, and the Wiyot tribes all carved redwood vessels, and they often traded them for goods made by tribes living inland.

Despite the immense changes that European settlement and modern industrial life have brought to this region, the art of carving the redwood log canoe survives to this day, thanks to people like Axel Lindgren—a man who dedicates his life to preserving his Native American heritage and culture. A mixture of Irish, Swedish and Native American, Axel prides himself on being a documented fifth generation Yurok of Tsurai Village (pronounced "chur–eye").





photos by the author



Connie Lindgren Garcia, wearing a 100 year old, authentic Yurok ceremonial dress made of buckskin and adorned with natural materials including Abalone and Dentallum tusk shells.

Here in Tsurai—now the California coastal town of Trinidad—Axel recently completed his third hand–carved redwood canoe, following the traditions of his forefathers. "I learned how to carve the redwood canoe in 1970 from Dewey George, who was a 100% Yurok Indian. I hope to pass on this knowledge to my four sons," states Axel matter–of–factly.

Axel, who is President of the Tsurai Ancestral Association, admits that little has changed in his small coastal community. The widely known and picturesque Trinidad Head—called "Tsurewa" by the Yurok and meaning "mountain–by–the–sea"—still dominates the landscape, making it one of the most scenic spots on earth.

Axel often lectures in schools and at campfire programs in the California State Parks, telling others about the Yurok culture and way of life. "My grandmother, Eliza Lindgren, was the last medicine woman of the Stone Lagoon–Little River area," he says, "and the hand–hewn wooden surf nets on display at the Trinidad Museum were made by my father."

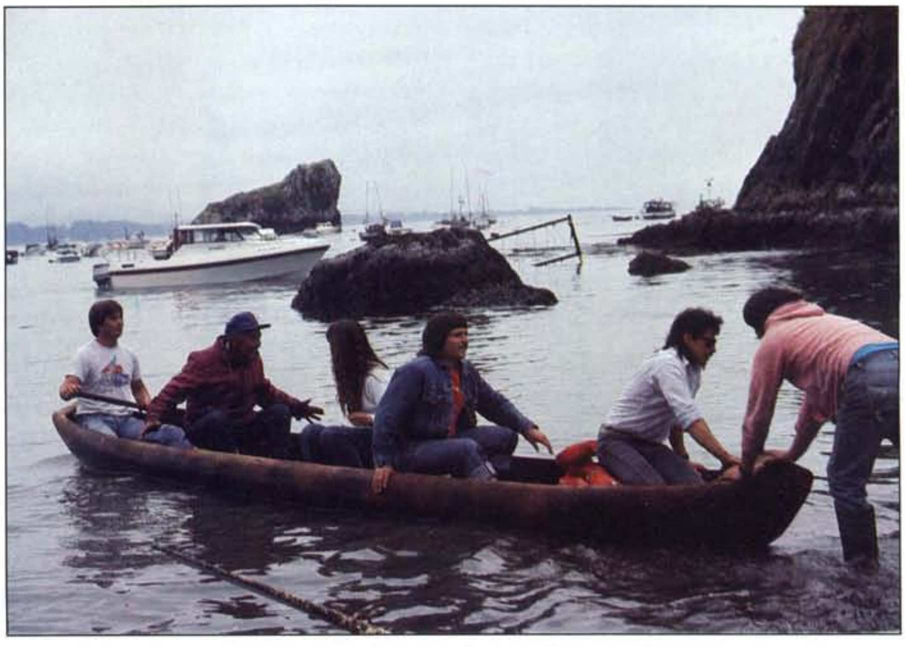
But Axel is best known as a canoe maker. His first redwood canoe is on permanent display at the Trinidad Museum. His second is in the South West Museum in Pasadena, California. The old growth redwood log from which Axel carved his most recent boat was donated by Louisiana Pacific Lumber Company. It's estimated to be about 825 years old and weigh ten tons, with a lumber potential of some 3200 board feet!

"The size of the log dictates the size of the canoe," Axel explains. "This particular one measures 20 feet long—42 inches between the outside center edges and 13 inches from top to bottom, with a three inch thick floor." Though he occasionally uses the traditional Yurok tools of elk antler and bone, Axel prefers to keep these aside for exhibition, and usually selects modern steel hand tools.

"I begin by splitting the log down the middle using a sledge hammer and a number of steel wedges. Sometimes I use wedges made of elk antler. I strip away the cull parts until I get down to solid wood. Then I begin to carve and hollow it out, going by feel as a potter does. I use both the curved cutting edge adze and the straight edge adze," he continues. "And the double bitted axe is as good as any. One thing special about this axe, however, is its curved handle—it conforms to the curve of the cut." Axel also uses a broad axe made of bone or stone, and a steel chisel with a curved cutting edge.

After splitting the log, he carves "body parts" into it to form the vessel. The bow and stern resemble the bridge and cheeks of the human face. Other parts, including the lungs, heart and kidneys are also carved into the log. Axel describes their significance—

"The canoe itself is a symbol of the continuation of life. And the



Axel, with his sons and friends, takes the canoe for its maiden voyage .

***Deborah R. Upshaw** is a freelance writer from Eureka, California and a frequent contributor to* Popular Woodworking.

Above, the canoe is brought down the hill for launching in Trinidad Bay, California. Below, Axel and his daughter Connie after the ceremonial purification of the canoe.

photos by the author

parts carved into it have both symbolic and practical importance. For example, the nose at the front is used for tying the anchor or securing it to a tree. At the back, just below the seat, are the kidneys. They're used to brace the paddlers' feet. Toward the front is the heart which may have a hole drilled into it for a mast and sail." When I asked why this canoe's heart had two lines carved into it, Axel explained that they represent his own surgical scars after he underwent heart surgery last year.

An important feature of the vessel's design is the carving of the canoe's bottom from the inside center of the redwood log. "That's the heartwood," explains Axel, "and that's where you want the toughest, most durable wood. That's where the canoe will take the bumps from the rocks and from dragging along the beach."

Another excellent feature is the canoe's low center of gravity. "That's the secret of its design. If it tips over, it rolls right back up. When the Yuroks hunted sea lions, many of which weighed from 1000 pounds to a ton, the men would turn the canoe over on top of the animal. When the canoe flipped back over, right side up, the sea lion would be inside."

After carving the canoe for nearly a year, Axel readied it for the Yurok purification process. The canoe is filled with its own redwood chips and shavings, piled up around and underneath the vessel, and then set on fire. "The practical part of this is that it seals and tempers the wood. That's what we used before there was Thompson's Water Seal," he says laughing. "The fire burns away the uneven edges and takes away the slivers on the inside and out. And it's a ceremonial act to rid the boat of demonic spirits."

Axel recently purified and launched his third canoe in front of television cameras, news reporters and a large crowd at pristine Trinidad Bay. As the canoe burned, Axel and his sons constantly stirred the fire with long sticks to prevent the flames from consuming the boat. Afterward, they rubbed the charcoal away using burlap sacks. Axel pointed out, however, that his forefathers would probably have used soft brush, like alder leaves.

"Caring for the canoe is simply a matter of keeping it damp—in or near the water, or in the shade," he says. "Any cracks that appear on the canoe after it is finished are sealed with Douglas fir pitch. The Indians would have collected the fir pitch in carved soapstone containers."

The only parts added to the solid carved redwood canoe are the bumper and the yoke. "Two sticks about 5/8" thick and one foot long are taken from the tops of fir trees. They are then burrowed into two holes made at the front of the canoe. They are bent and folded across horizontally, and then bound inside and out with spruce roots or hazel nut twigs. This makes a natural bumper. They hadn't discovered chrome yet! The yoke, added at the front and formed from the forked branch of a tree, is a symbol of wealth."

Axel intends to take the completed Yurok canoe on a voyage up the coast to Seattle, Washington for a Native American conference held on Puget Sound. The canoe will also be part of the White Deer Skin Dance, itself part of a ten day renewal and fertility festival held at the Hoopa Reservation in California. After that, it will be put up for sale. **PW**

Axel's sons offer canoe rides to the public on the day of the Salmon Festival.

The Indian Adze
An Easily Made Tool from Out of the Past

by Warren Asa

Last summer I spent ten weeks traveling through Alaska and British Columbia in search of Native American woodcraft. I visited a dozen carving workshops—some are large tribal carving sheds where several sixty–foot totem poles can be worked on simultaneously; others are small, one person operations. In every case, carving adzes were in use, and in every case they were made by the carvers themselves from tree crotches, just as their ancestors had done. Today the elk antler or stone blades have been replaced with ones of steel, but many craftsmen still bind the blade in place with rawhide in the ancient manner.

As a student of Indian lore I knew that the adze had been much used by the northwest coast Indians in olden times, but I had no idea that it was so popular today. This fact inspired several ideas—as a woodworker, I thought here is an easily made tool that many woodworkers would like to have in their shops. From the view of the blacksmith who has made the eye–handled European type adze, what a simple and inexpensive way to make a fine tool. And as a student of Native American arts and crafts, I felt very privileged to discover this old tool so completely integrated into modern workshops.

The adze was a highly regarded tool in American pioneer days; it was used to square logs for construction, to form ship timber and ox yokes, and to make railroad ties. In the modern workshop, a good adze can have many uses—like shaping bowls and chair seats, and for all large carving projects. The curved blade adze is the ideal tool for roughing out, while one with a straight blade does nice finish work. If you've ever seen a genuine hand–hewn beam, not the ersatz type made with a disk sander, you were probably impressed with the uniform chip placement and the resulting pleasing texture. Some hand–hewn beams were done with the broad axe, but when you see a beam with a beautiful, uniform, undulating pattern, you've discovered the

Warren Asa has been woodcrafting since his scouting days. He specializes in native American folk craft.

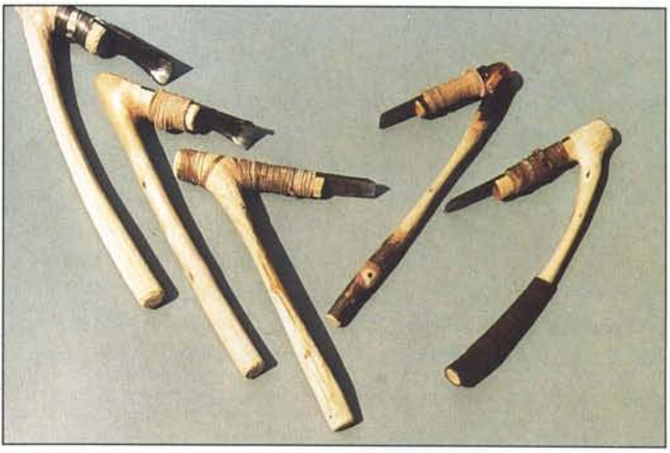
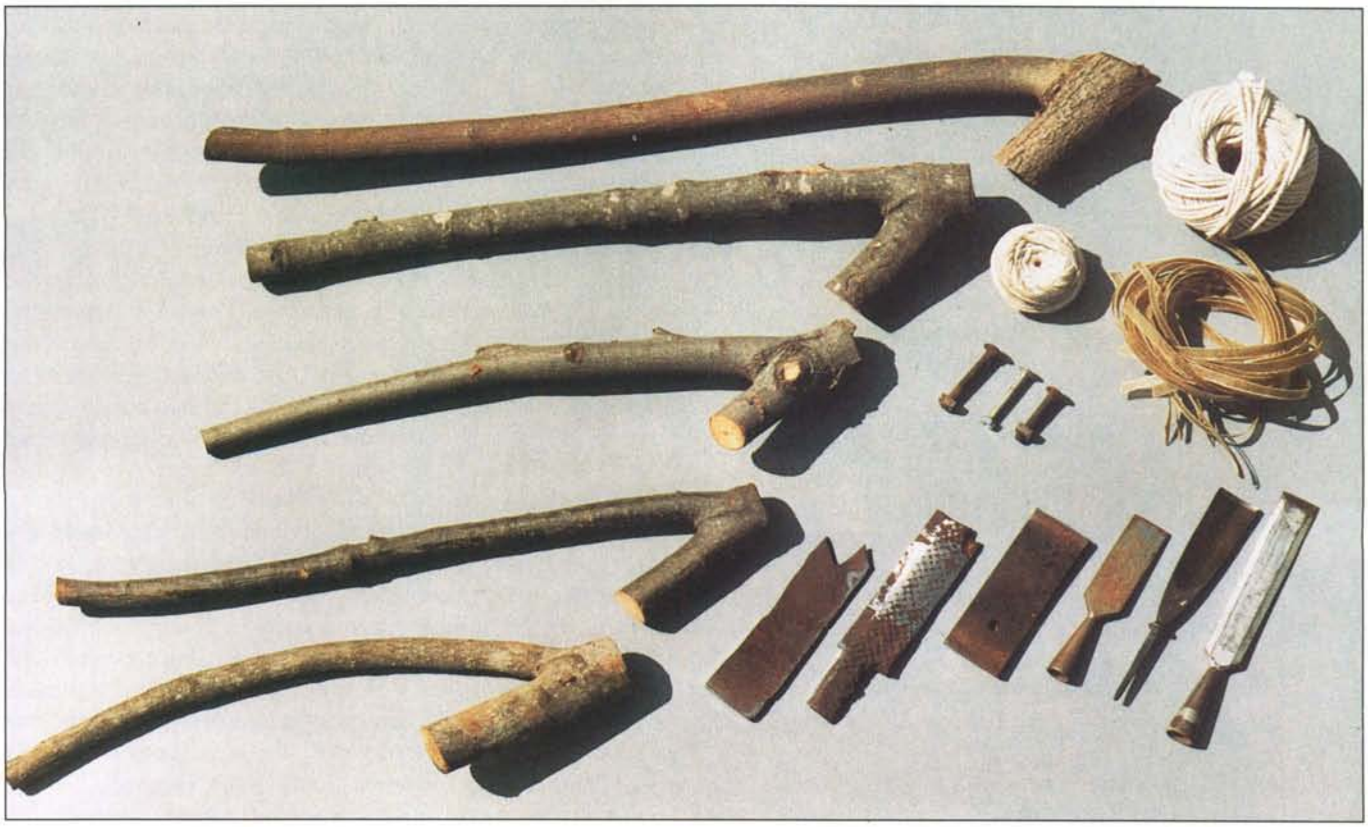


photo by the author

The raw material for making Indian adzes—handles, blades, blade blanks, and cordage and bolts for fastening.

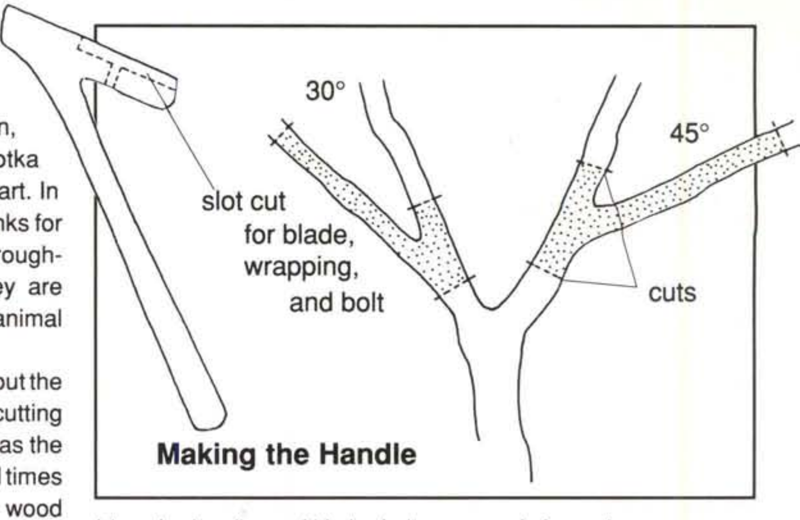


track of an adze.

The art of the northwest coast tribes has a unique quality, recognizably different from that of any other North or South American native groups. The Tlingit, Tsimshian, Haida, Bella Coola, Kwakiutl, Coast Salish and Nootka peoples used the adze to create much of this distinctive art. In ancient times, the tool fashioned totem poles, shaped planks for their houses, hollowed and dug out canoes, and served throughout their extensive woodworking repertoire. Today they are mainly used on totem poles, decorative wall hangings and animal motifs.

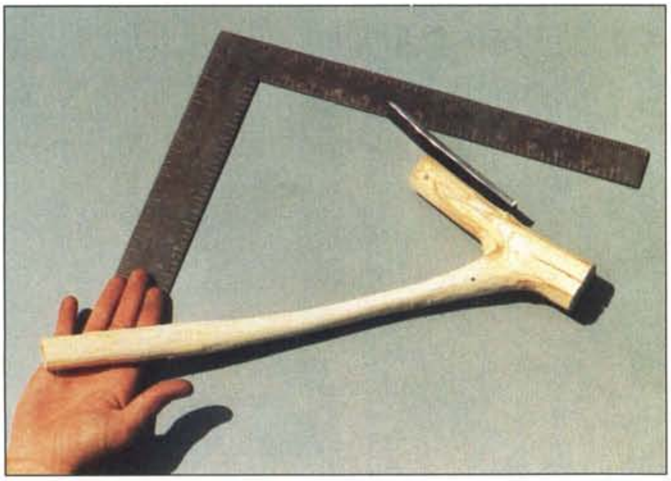
With my interest aroused, I started asking questions about the best wood for handles, the types of steel, and the size and cutting angle. Vine maple, common along the northwest coast, was the most often suggested wood for handles. I've used it several times and it is a good handle wood. But any reasonably tough wood with a bit of flexibility will do. I've had good luck with ash, oak, other maples, and some of the fruitwoods.

The larger shops I visited had adzes in several sizes, from large two–handed types down to small finishing models. For the home shop, try handles from 10" to 14" in length. The thicker branch of the crotch takes the blade and the smaller branch becomes the handle. When you're tramping the woods looking for adze handles, keep your eye open for crotch angles of 30° to 45°. The wide angle will make a good roughing–out adze, while the tighter angle serves for a finishing model.

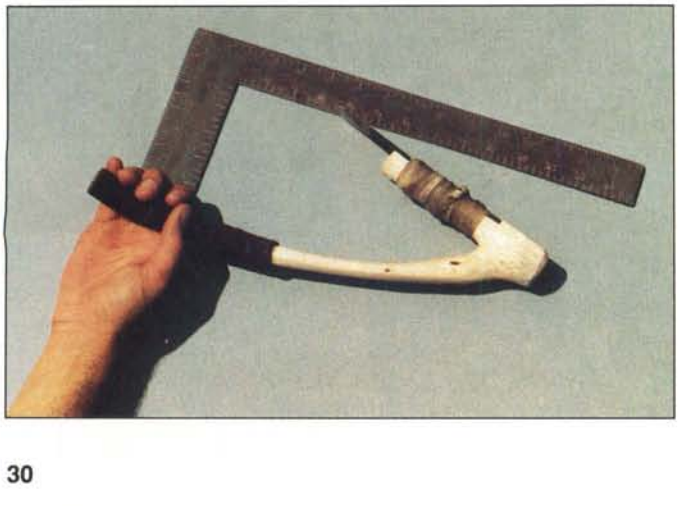


The adze handles and blades below are ready for mating.

photos by the author



The roughing–out adze above is checked for correct angle before mounting the blade. The finishing adze below passes the 90° test.



The easiest way to get a blade for your adze is to use a chisel, either a straight carpenter's model or a curved carver's gouge. If you don't mind sacrificing the chisel, grind off the socket or tang, being careful not to overheat it and draw the temper from the blade end. If you want to keep the chisel intact, mount it as is—provided the blade and socket or tang are not too long.

Another approach is to have a blacksmith or metalworker make some adze blades for you. Or try it yourself—the making of a straight blade is not difficult. You'll need a piece of tool steel roughly 1/4" X 1-1/2" X 7". I've used steel from large saw blades, springs and files. Not all such "pick up" steel is perfect, but with a bit of trial and error you'll find something that will work for you. Grind the angle on the blade at 20° to 30°, but don't finish the sharpening; that is, leave the edge about 1/32" thick. This thickness will act as a safeguard during tempering.

Drill a hole in the blade now so it can be bolted to the handle. If you're working with a hardened piece of steel, it will have to be annealed before you can drill it. Heat it red hot in a charcoal or coal fire and then bury it in the hot coals and let the whole mass cool slowly for several hours. Since I use carriage bolts to fasten my adze blades, I square up the round hole after drilling to accept the square shank of the carriage bolt.

To the non–blacksmith, which includes almost everybody, tempering is a unique and mysterious operation to be viewed with awe. I'm sure that 1,500 years ago the famous sword makers of Damascus were suspected of possessing magical powers. But tempering is not all that mysterious or difficult, and if you'd like to give it a try, I'll tell you how. You will need a heat source, like an old blow torch, a modern acetylene torch, a powerful camp stove, a hot charcoal fire, or a blacksmith's forge. Set up a work area outdoors away from combustibles, and have a pair of tongs or hefty pliers at hand and some sturdy leather gloves.

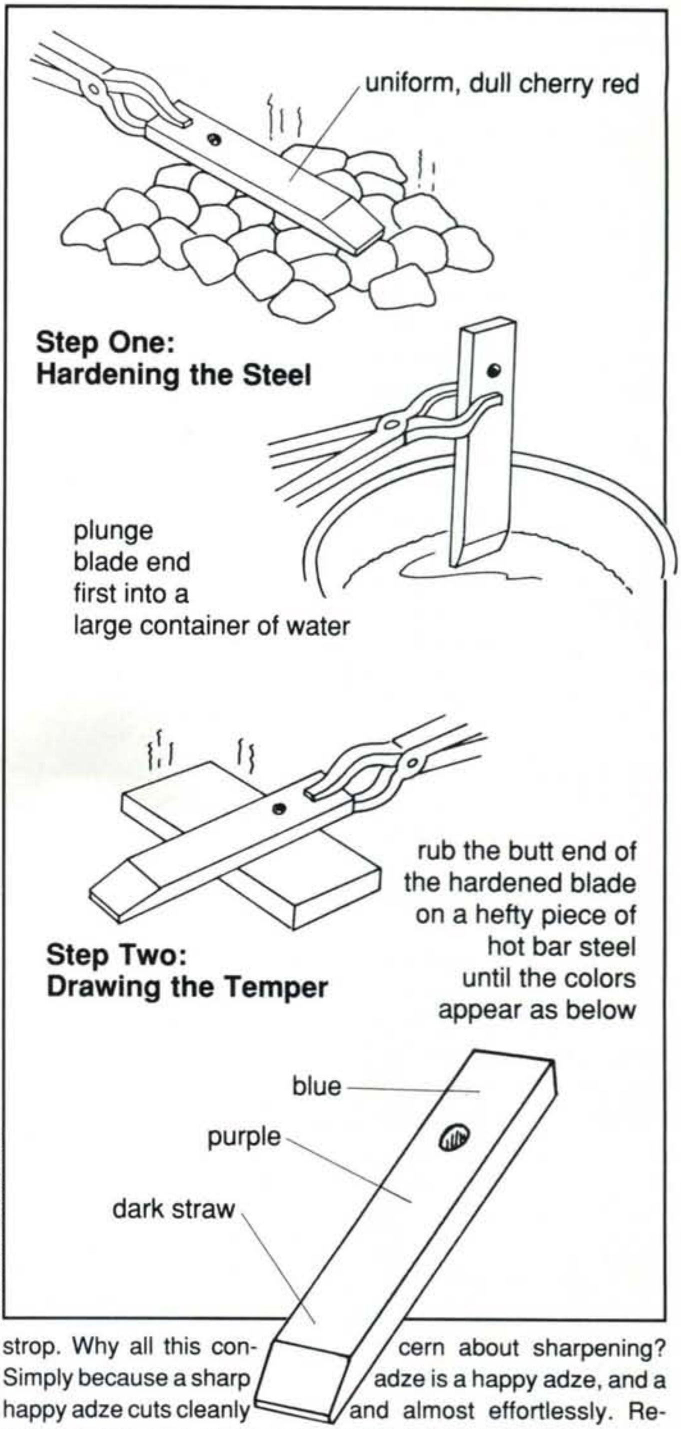
Tempering is a two–step process that realigns the molecules in the steel so that the finished piece has the necessary hardness and toughness in the right places. Tempering is always somewhat of a trade–off between hardness, which is required to hold an edge, and toughness, which we need to keep the blade from breaking. To start the process, fire up your heat source, grasp the steel with the tongs and heat it to a uniform dull cherry red. This is not as hot as the bright red heat at which blacksmiths work steel. Holding the metal as shown in the illustration, plunge it sharp edge first into a large container of water. If the steel is so hard that a file won't touch it, you have completed step one. If it's not "glass hard," you either don't have tool steel to begin with, or it wasn't hot enough when you dipped it.

This first step is often referred to as "hardening" and must be followed by a second step called "drawing the temper." To do this, polish one side of the blade with emery paper. You can hold the blade directly in the flame to draw the temper, but I suggest a more controlled method. Heat one end of a rather hefty piece of bar steel red hot and lay it in a convenient, safe place. Next, grasp your blade with the tongs, polished side up, and start rubbing it against the hot bar. Rub in such a way that the butt end of the blade receives the major transfer of heat. After about thirty seconds you'll notice that the steel at the butt is turning a pale straw color. This will be followed by a darker straw which shades into purple and finally blue. Keep rubbing the blade on the bar until the colors run clear down to the cutting edge. When you have a dark straw color (some might call this yellow–brown) at the cutting edge, plunge it into water as before. With any luck, the butt end of the blade will be blue when you cool the blade—which means it will not be very hard but rather will be tough and won't break. You can temper other tool steel using this same technique. Before you get too involved, though, read more about the subject. Most books on blacksmithing have a whole chapter on tempering.

It's now time to prepare a handle to accept your blade. What you want is a 90° angle between the taper you ground on the blade and the fingers of your hand as you grip the handle (see the photo to the left). A carpenter's square will help with the layout. When you have achieved the angle, mark the handle and saw off the waste slab. Check again to see if you still have the 90° angle. If not, doctor it with a spoke shave, rasp or disk sander. Then cut the insert to receive the blade. Have your blade overlap the wood from one–half to two–thirds of the blade length. If you have trouble getting a snug fit, rub the back of the blade with a pencil and fit it in place. The pencil lead marks on the wood will show where to remove stock for a tight fit.

The handle of an adze, just like the handle of a hammer or an axe, should be thinned down at the neck to provide a bit of spring to prevent arm fatigue. The handles for finishing adzes should be greatly thinned to permit plenty of spring—necessary for flipping out the small chips made during finish work. In addition to shaping the neck and removing splinters, you can finish the handle as fancy or as rustic as you like.

The final sharpening of the blade should be done on some sort of cooled stone so the steel will not overheat and draw the temper. I use an old–fashioned foot–powered water stone wheel. It will take fifteen minutes or so to grind away the 1/32" edge you left on the blade, *but don't rush it*. After the cooled wheel, continue with a fine sharpening stone and then proceed to a hone. The next step is leather impregnated with rouge, and finally, a leather strop. Why all this concern about sharpening? Simply because a sharp adze is a happy adze, and a happy adze cuts cleanly and almost effortlessly. Remember this, and sharpen often while using your adze.

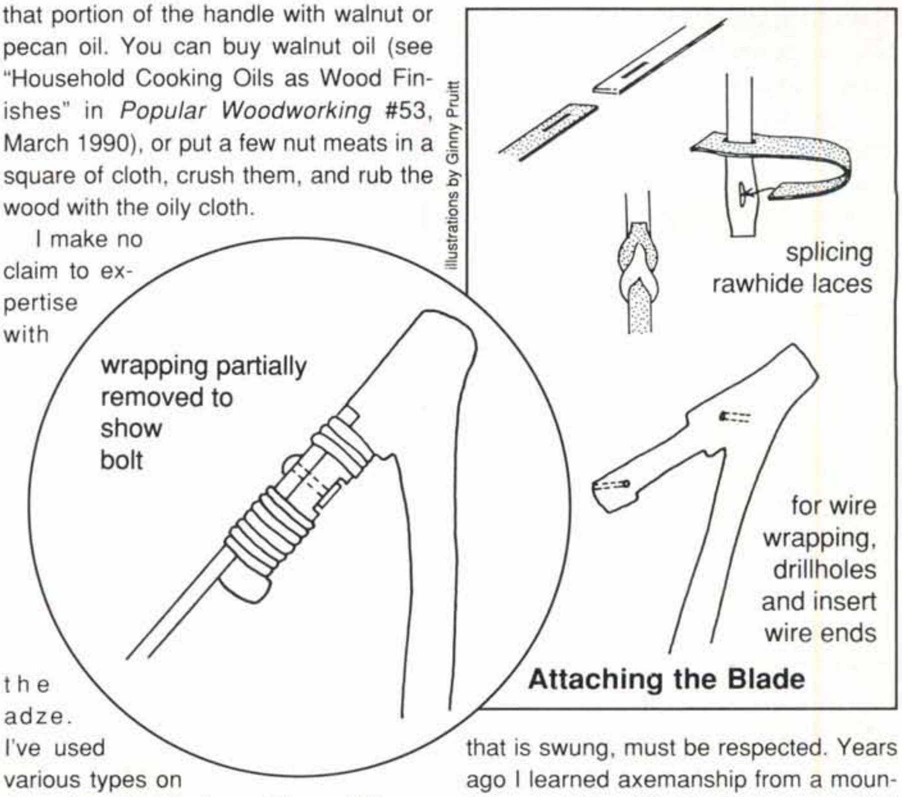


Illustrations by Ginny Pruitt

Now we come to perhaps the most critical step in the project—attaching the blade to the handle. Of the many adzes I observed during my trip, this attachment appeared to be the biggest problem. When the head of a tool made with an eye—like a regular hammer, axe, or adze—loosens, it's dangerous because there's always the possibility that it will go rocketing across the shop. The Indian adze is generally not dangerous when the head is loose, but it cuts less accurately, the chips don't pop out as well, and the handle gets chewed up. The lesson should be loud and clear—mount the adze head accurately and strongly the first time around. I recommend bolting it to the handle. If you go this route, drill the hole in the handle at this time. I countersink the nut if there's plenty of wood in the handle; if not, I tighten the nut over a washer and do the wrapping over the top of the nut.

I've wrapped adze blades with cord, rawhide, and wire; each has its strong points. Cotton, linen, fish line, or a non–stretch synthetic cord are the easiest to use. Keep the cordage tight as you wrap. You can tie these materials with conventional knots or use a whipping techniques as used on the ends of rope. Rawhide, however, is the authentic Indian way of fastening an adze blade. It's soaked in water for several hours before use and shrinks tight and hard when it dries. It can be purchased at leather craft stores. Do not use so–called "rawhide boot laces" since these are actually made of tanned leather and have nothing in common with real untanned rawhide. The illustration (above right) shows the Indian way of splicing two pieces of rawhide lacing. Wire is harder to use than the other wrapping materials, but it's strong and durable. My favorite is a 20 gauge non–rusting type made of Inconel, but any flexible steel wire—even baling wire—can be used. The best way I know to anchor the ends of the wire is to drill a hole the size of the wire at the start and finish of the wrapping.

I always varnish my adzes wrapped with cord or rawhide because if they get too damp and the binding material stretches, there goes your tight fit. Use any good quality exterior varnish and let it really soak into the wrappings. Apply as many coats as needed to saturate the binding. Since I don't care for varnish on the hand grips of my tools, I usually rub that portion of the handle with walnut or pecan oil. You can buy walnut oil (see "Household Cooking Oils as Wood Finishes" in *Popular Woodworking* #53, March 1990), or put a few nut meats in a square of cloth, crush them, and rub the wood with the oily cloth.


splicing rawhide laces
wrapping partially removed to show bolt
for wire wrapping, drillholes and insert wire ends

Attaching the Blade

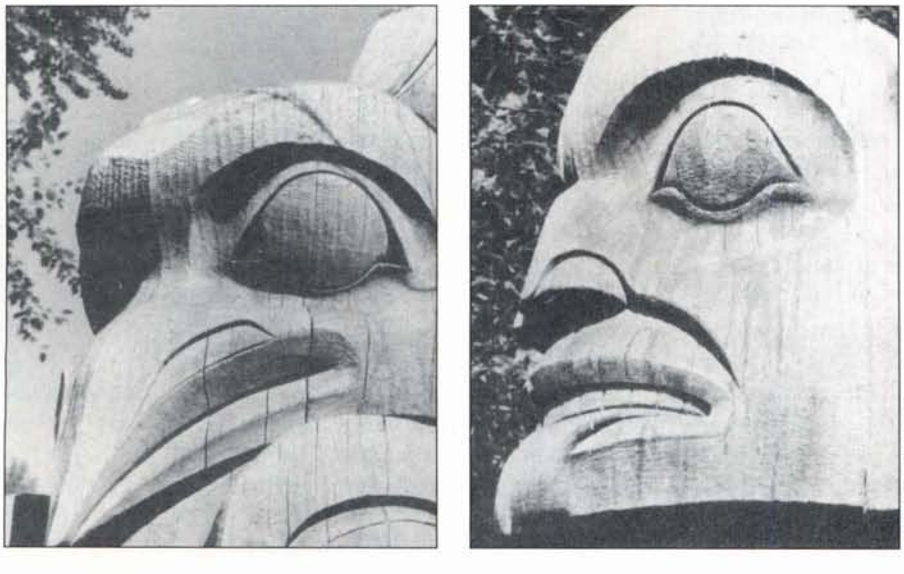
Illustrations by Ginny Pruitt

I make no claim to expertise with the adze. I've used various types on a number of projects, and I am still learning about this versatile tool. The Indian carvers are amazing in their ability to wade into a huge trunk of yellow cedar with a curved adze and take out prodigious amounts of wood when roughing out a totem pole. The next day they may finish a beaver motif in alder with delicate, rapid strokes from a small straight adze. When asked about their talent, they shrug and say, "I just do this all the time." The skill acquired from years of practice is evident.

One thing I can say for sure is that an adze, like any sharp tool, especially one that is swung, must be respected. Years ago I learned axemanship from a mountain man in New Mexico. He had a rule that applies perfectly to the adze: "when chopping, know what you'll hit if you miss what you're aiming at." So rule one is be careful with your adze. Rule two is keep it sharp. After hitting the work, a dull adze bounces around causing all manner of mischief.

Experts say of everything from nail hammering to flycasting that "it's all in the wrist," and skillful use of the adze does require dexterity. After you've made a few adzes, have a long practice session on a log or thick plank. Try roughing out a trough with a curved adze, practice taking out small chips with a straight–bladed model, and try both tools going across the grain. Even with a sharp, perfectly designed adze, it's difficult to work with much success across the grain, but you should be able to cut smoothly at a 45° diagonal to the grain. Many light strokes do more work than a few haymakers that bury the blade in the wood. But even on your light blows you must use enough force to flex the handle a bit so the chip will pop out. For a first project try something that can be largely completed with the adze, like a canoe paddle, tray or bowl.

As with any arm–swung tool, extensive practice makes for accuracy of cut and confidence of mind. Work with your homemade adze until you get the feel of it, and then be surprised at the uses you find for this old–new tool. **PW**



These typical Native American totem carvings clearly show the marks left by the adze . Note the forehead of the figure on the left and the eye and chin of the figure on the right.

photos by the author

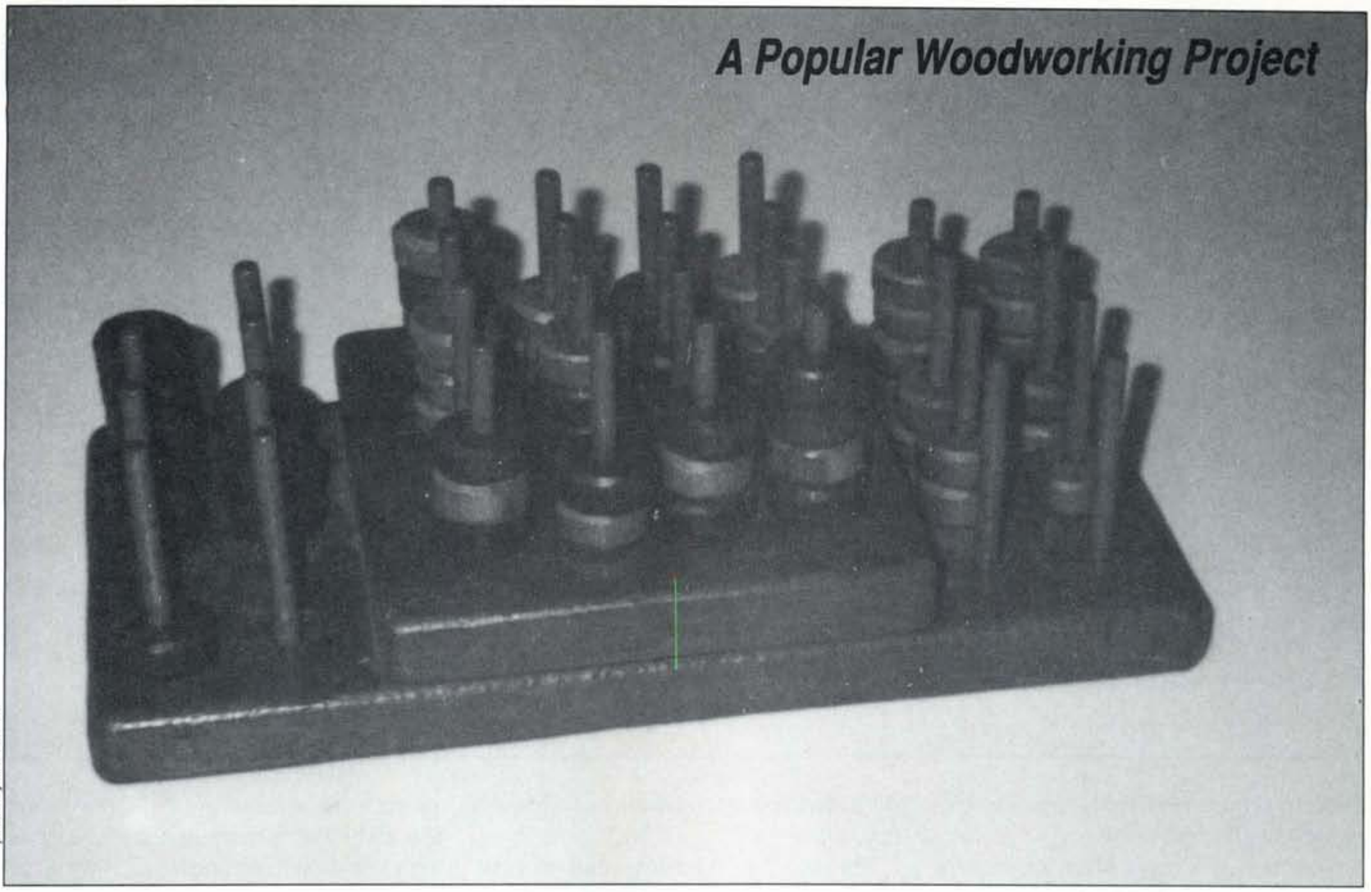


photo by the author

3–Dimensional Tic Tac Toe

by Curtis Dillon

A grade–school teacher introduced our class to three–dimensional tic tac toe back in the early sixties. It soon became an obsession, taking up all our time at recess. I remember playing in great tournaments, holding the pieces between sweaty palms while waiting for my turn, hoping the enemy wouldn't see my line of attack. Schoolmates would look on, hoping I'd lose so they might play the winner.

We soon learned to make our own sets—a bit ragged in appearance but functional nonetheless. I made my first out of the side boards of an old cotton trailer, a broom stick, and the dowel reinforcements inside my mother's kitchen curtain rods. The game board consists of two hardwood boards, one a square playing area centered on top of another, rectangular piece which provides storage for each side's pieces. Dowels act as the stacking pins, and the playing pieces are cut from 1" dowel rod, center–drilled, and divided into dark and light. For playing rules and diagrams, see the sidebar on page 35.

Use 1 X 6 clear ash, beech, birch, or maple because they'll best match your dowel stock. If you intend to paint the board, use white pine or even 3/4" plywood. Since dressed 1 X 6 stock is 3/4" thick and 5-1/2" wide, cut the playing board precisely 5-1/2" square. Cut the 11" long base board from the same stock.

To mark and drill the faces of the boards, first cut out the template in the PullOut™ Plans located in the center of the magazine. Tape it to the top face of the playing board—the side with the best grain. With a center punch or large blunt nail and a mallet, lightly tap a dimple through the paper and into the wood at each of the sixteen drilling points. Accuracy here is essential for the final appearance later. Now remove the template and cut it down the middle (on the dotted line). Tape the halves to the top face of the base board, one flush at each end. Mark the drilling points as before and you're finished with the template.

Now center the playing board precisely on the base board and clamp the two together, using C–clamps padded with scrap. The side edges should be flush and each end of the base should extend exactly 2-3/4" on either side of the playing board. You can use a hand drill, but the results are likely to resemble what my schoolmates turned out. I recommend a drill press for a real "picket fence" appearance. Use a 15/64" bit, clean it often while drilling, and go slowly. You don't want to burn or ream out the holes too much, or splinter the exit holes. Pass the board consistently in the same direction under the drill press, so that any small deviation in angle affects all the holes in the same way. To get the C–clamps out of the way, drill two of the holes at opposite corners of the playing board all the way through both pieces. Then cut two 1-1/4" lengths of 1/4" dowel, sand lightly, and drive them into the

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Curtis Dillon is a veterinarian in Conroe, Texas, who likes to blend wood, metal and leather in crafting personal functional items.

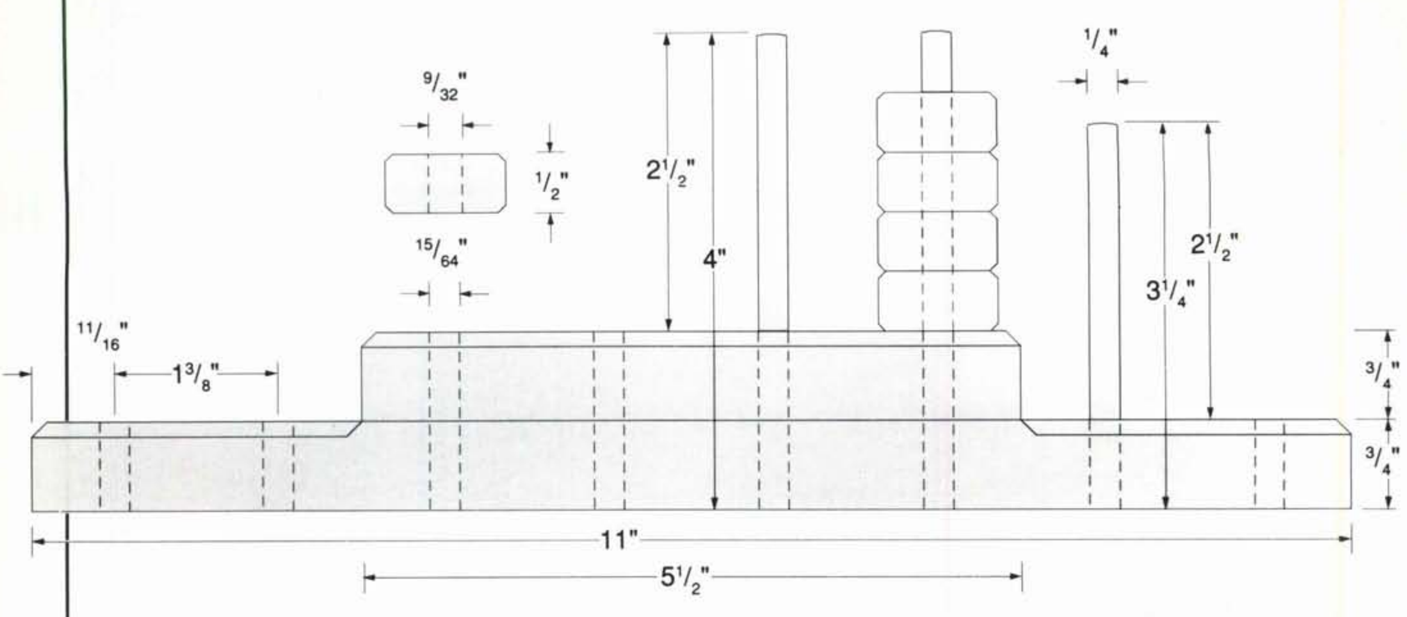


Figure 1. Side View

See the PullOut™ Plans section for a full–size pattern.

holes to secure the boards together temporarily without clamping.

Drill the remaining holes completely through both boards. You should end up with a total of thirty–two holes—sixteen through both boards and eight at each end of the base board.

After lightly marking the edges of the two boards so they can be rematched, use a blunt nail to knock out the temporary dowels in the same direction they went in. Once separated, the boards can be sanded and any burrs or splinters removed from around the holes. Decide now whether you want to leave all edges crisp and square. If you do, soften them slightly with a sanding block. This design will most likely chip through usage, so consider chamfering them. The chamfer should not extend more than 3/16" onto the face of the boards, and do not chamfer the edges where the two boards meet (see Figure 1 above). Final sand now.

To make the stacking pins, clamp two 1/4" diameter, 36" long dowel rods side by side in a padded vice and mark off sixteen 4" lengths. On two more rods, mark off sixteen 3-1/4" lengths. Saw them all off for a total of thirty–two stacking pins—be sure to saw consistently on the same side of the marks. Lightly chamfer both ends of all pins with sandpaper, a power sander, or even a bench grinder. The chamfer at one end will facilitate driving them; the other will allow the playing pieces to drop easily onto them.

Position the boards together on a flat, stable surface. Apply a small amount of carpenter's glue around one end of two of the 4" pins and drive them through the corner holes you used earlier to pin the boards together. Tap them down with a wooden mallet until they're flush with the bottom of the base board. Drive the remaining 4" pins through both boards. If the fit is too tight, sand them lightly. Wipe off any excess glue. The sixteen 4" stacking pins should now stick out evenly 2-1/2" from the top surface of the playing area. Tap lightly from the top or bottom to even them out—before the glue dries. Next, glue and drive the 3-1/4" long pins into the holes in the ends of the base board so they also project 2-1/2". You may need to sand the bottom of the base board again. Both boards should now be firmly joined and ready for finishing.

On to the playing pieces. Clamp a 1" diameter, 36" long dowel rod in a padded vise and mark along it every 1/2", marking a number of extra pieces beyond the sixty–four required. To saw them off evenly, try this jig: take a 2" to 3" length of 1" internal diameter pipe (copper tubing or even cardboard will work). One end must be cut straight and true. Pass the dowel rod through it, and using the pipe's square–cut end, pencil the circumference of each 1/2" mark along the rod. Saw off the sixty–four pieces and some spares with a fine–toothed back saw.

To center punch each piece accurately, make another jig using your 1" diameter pipe and the 3" to 4" piece of 1" dowel left over. One end of the dowel piece must be center punched accurately and drilled about 1" deep. Size the hole a little smaller than the diameter of a cut off, blunt 1-1/4" nail which you drive into the hole to make the punch (see Figure 2). It should fit snugly inside the 1" diameter pipe jig; if it's loose, wrap it with tape to snug it. Now place a playing piece on your work surface with the even end of the pipe jig over it. Drop the punch down through the pipe and tap it lightly with a mallet to mark the piece. Repeat the procedure on all the pieces.

Accurately drill each through the mark using a 9/32" bit in the drill press. Make sure the piece lies flat while you drill by holding it with pliers (wrap the jaws with tape to protect the pieces). An even better way to hold them is to drill a 1" hole in a flat piece of 3/8" plywood which you've first clamped to the drill press table. Each piece can be placed in the hole and drilled accurately. If the pieces fit snugly in the hole and you keep the plywood clamped in the right position, there's no need to center punch the pieces at all. Lastly, sand the pieces and slightly chamfer the rims of

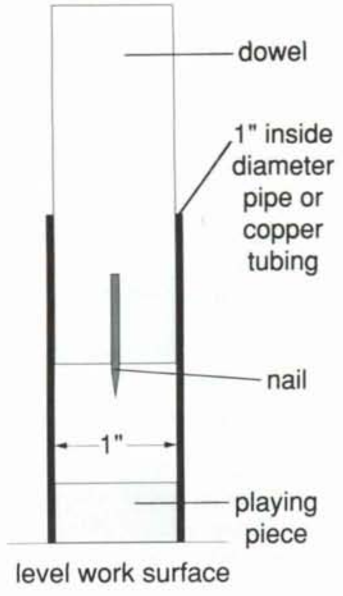


Figure 2. Center Punch

Illustrations by Phil Fischer

each side so that the players can easily separate and grasp the pieces on the board.

Begin finishing by brushing on a diluted stain quickly. Several such applications will be more effective in covering all the surfaces than a concentrated wipe–on, wipe–off type stain. Don't allow it to pool at the bases of the stacking pins. When dry, spray on a thin coat of low–gloss polyurethane or varnish. When brushed on, it tends to run and pool around the pin bases long after you've finished. Half the pieces can be colored by stringing them on a wire and dipping them in the diluted stain until they match the color of the board. The other set should be left natural or stained a distinctly lighter color. When dry, spray or dip them in diluted clear finish. If you want to paint the boards instead, brightly colored spray enamels are best. We woodworkers may take pleasure from the natural beauty of the wood, but most kids like them loudly colored.

When the finish is dry, glue a piece of felt backing to the bottom so it won't scuff. Another nice touch is to add brass fixtures to the corners, especially if they aren't beveled. You can also vary the playing pieces by making one set out of 1" square stock, or out of grooved dowels. Now study the sidebar and get familiar with the game before you show it to the kids—that way you just might stand a chance. PW

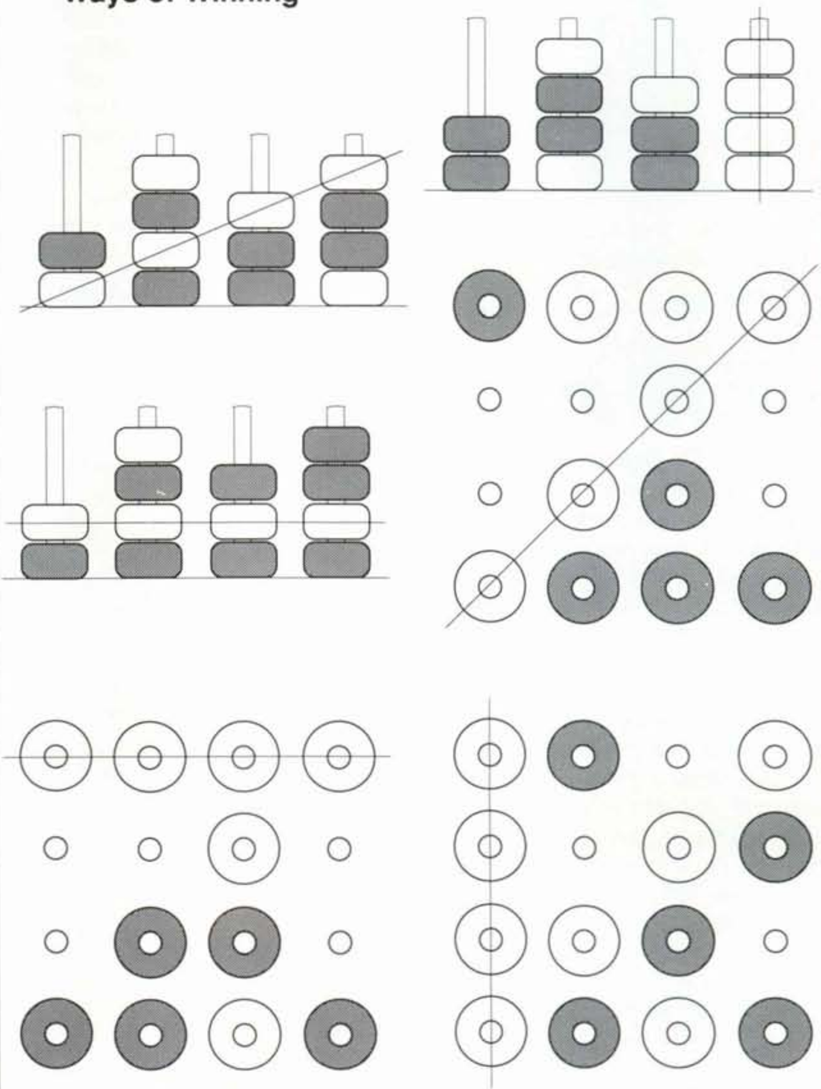
How to Play the Game

by Curtis Dillon

Players take turns placing pieces one at a time on the stacking pins. The object is to get four pieces in a row, as opposed to the three required in the original game. A row can be in any direction—horizontal, vertical or diagonal—as the illustrations below show.

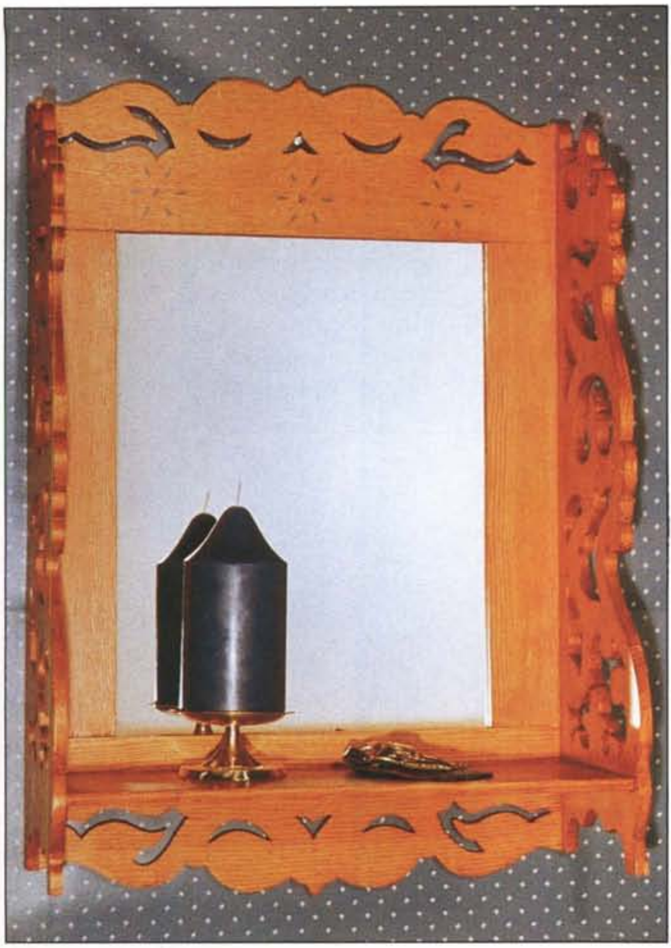
Three–dimensional tic–tac–toe is an excellent game for appreciating the difficulties of simultaneous attack and defense. Players must not get so involved with offensive plans that they fail to calculate the opponent's intentions. The experienced player learns to open several lines of attack in case one is blocked, and to force the opponent to place pieces where he can build on them. It often turns out that the loser was unable to block two lines of attack in one move. The need to think several steps ahead and to visualize multiple dimensions are fun challenges—and sure to interest and benefit kids. PW

Ways of Winning



A Popular Woodworking Project

Fretwork Shelf and Mirror



David M. Camp

by Devore O. Burch

This handsome shelf would look marvelous hanging in a hallway; it provides a place to set your keys and gloves and has a mirror for checking your appearance before you step out. If you like, you could build it with a raised panel in place of the mirror, or you could simply make the back from one solid piece. The shelf shown here was made of Douglas fir finished with Minwax® golden oak stain and Deft® clear satin lacquer.

This type of scroll saw work was very popular in years gone by, but somewhere around World War II it seemed to fade away. With the advent of many high–tech jig saws as well as other reasonably priced scroll saws, this type of construction seems to be regaining popularity. Whether your saw is new or old (mine is over 40 years old), you will enjoy the end product.

Start by planing your material to 3/8" thickness. If you don't have a planer, you can buy 3/8" material through many mail order sources. Refer to the cutting list for the sizes you'll need.

The back frame is rabbeted for the mirror, and this rabbet is also incorporated in the joinery that connects the stiles (A) to the rails (B). The stiles have tenons on each end that fit into the rabbet, forming a lap joint (see Figure 1). After cutting these four pieces to size, set up the dado head on your table saw to cut 1/2" wide X 3/16" deep. Attach a wooden auxiliary fence to the saw's fence and bring it up against the blade to cut the rabbet on the inside back surface of all four frame members. Using the miter gauge with this same fence and dado setup, turn the stiles over, and rabbet the ends on their front surface. This forms the tenons.

***Devore O. Burch** is a woodworker in Fort Worth, Texas.*

Next scoot the fence over toward the blade, cutting into the wooden auxiliary fence so that only 3/8" of the dado blade is exposed. Use this setup to cut the rabbet on the inside back edges of the sides (C).

Cut the shelf (D) to size and round both corners of the front edge with a 3/16" round over bit [*Editor's note: I used the round portion near the bearing on a small ogee bit to round this to my satisfaction*].

Chuck a 3/8" straight bit in your router, and set it to a depth of 3/16" by placing the router base on the surface of one of the sides (C) and lowering the bit into the rabbet you cut along the back edge earlier. As shown in Figure 2, a framing square makes a good fence to guide the router in cutting the dado for the shelf. Measure your router base to determine its radius, and add 3/16" (the radius of the 3/8" bit) to determine where to clamp the square in relation to where you want the bottom of the dado. In this case, the bottom of the dado should be 2-1/8" from the bottom end of the sides, so add 2-1/8" to the formula above and clamp the square with its tongue at this point and its body aligned flush with the back rabbet. Mark the width of the shelf on the side pieces, measuring from the edge of the rabbet to determine where to stop routing. Be sure to rout these pieces as opposing right and left

Figure 1. The Back Frame Assembly As Viewed From Behind

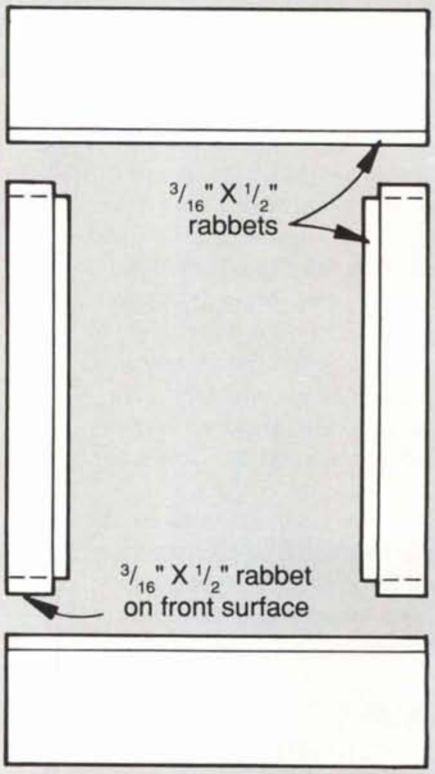


Figure 2. Using a Framing Square as a Router Fence

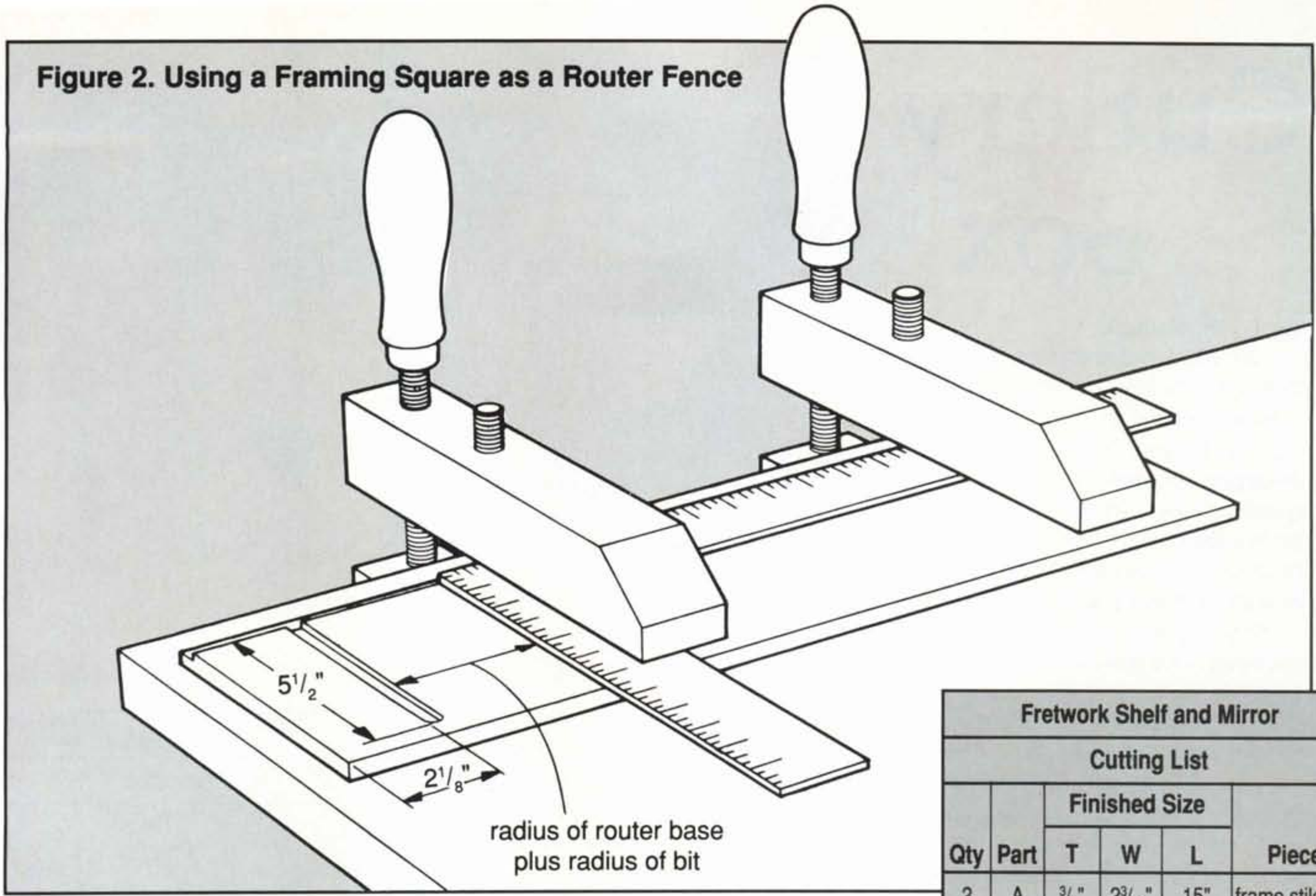
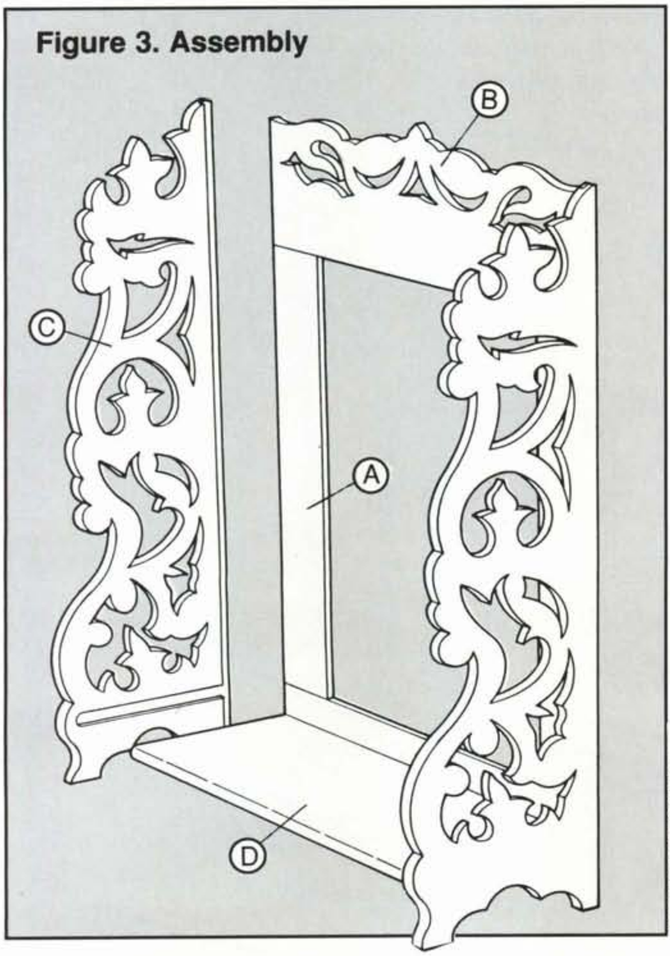


Figure 3. Assembly



illustrations by Tom Larson

sides, and when you stop the cut, wait for the router to come to a complete stop before lifting it out of the cut.

Fretwork Shelf and Mirror					
Cutting List					
		Finished Size			
Qty	**Part**	**T**	**W**	**L**	**Piece**
2	A	3/8"	2 3/16"	15"	frame stiles
2	B	3/8"	4 5/8"	14 7/8"	frame rails
2	C	3/8"	6 1/2"	21 1/2"	sides
1	D	3/8"	5 1/2"	14 7/8"	shelf
Supplies					
1		3/16"	11 1/2"	15"	mirror
8	panel retainers				
2	triangular hangers				

Panel retainers and triangular hangers are available from: Armor Products, Box 445, East Northport, NY 11731, (516) 462-6228 or Meisel Hardware Specialties, Box 70, Mound, MN 55364-0070, 1-(800) 441-9870.

Now you're ready for the scroll sawing. Transfer the patterns for the sides and rails (from the PullOut™ Plans section) onto one of each of these pieces. Tape the two sides together and the two rails together with their rabbets facing in; use several pieces of masking tape on all the edges. Now drill holes through the pieces in each of the center cutout areas so you can thread your scroll saw blade through, and cut both pieces simultaneously. Make all the interior cuts before cutting the outer edges.

Sand all the parts before assembly. If you were careful with the scroll saw, you shouldn't have to do much more than soften the corners on the fretwork. Touchup work in the cutouts can be done with small files or an emery board.

Glue the back frame together first. Smear a little glue on the stile tenons and clamp them so the outer edge is flush with the ends of the rails. Use small handscrew *clamps with wax paper* to hold these lap joints. When this frame is dry, finish assembly of the piece by gluing the shelf and the frame between the sides (see Figure 3).

Apply the finish of your choice, and install the mirror with panel retainers. Then attach two triangular picture hangers, and decide where to hang this charming shelf. **PW**

Cutlery Box

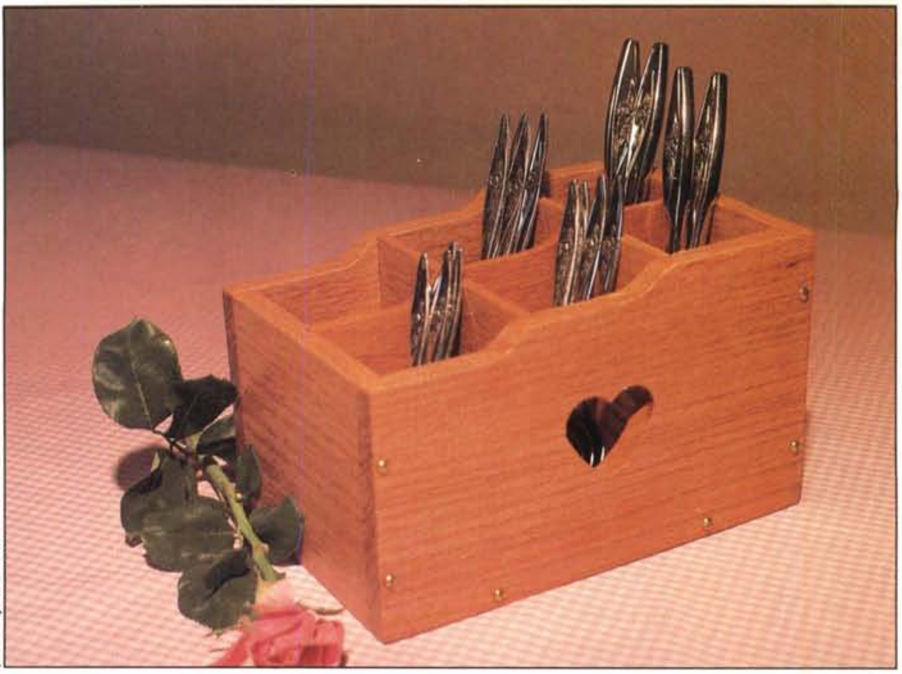


photo by the author

by L. M. Kueck

Like many woodworkers, I'm always looking for ideas for projects that will come in handy around the house. Most of my inspiration comes from woodworking magazines or from my wife who asks me questions like, "Would you please build me a cutlery box?" This design is easy to build, permits easy access, and with its removable partitions, is easy to clean.

Begin by transfering the patterns for the sides (A) and dividers (B), (C) and (D) from the PullOut™ Plans to your wood. Saw and route all the pieces to the dimensions given in the cutting list. I planed the 1/4" stock slightly to assure an easy slide fit in the notches and dadoes. Cut 1/4" wide, 1/8" deep dadoes down the inside surfaces of the sides (marked on the PullOut™ Plans) and down the center lines on the inside surfaces of the front (E) and back (F) to receive the dividers.

To shape the hearts, try using a 1" Forstner bit, overlapping the two holes about 1/16", and then jigsawing their final outline. Glue and screw the sides to the front, back and bottom. I drilled a pilot hole and threaded the six holes per side with a #6 drywall screw to prevent breaking off the brass screws.

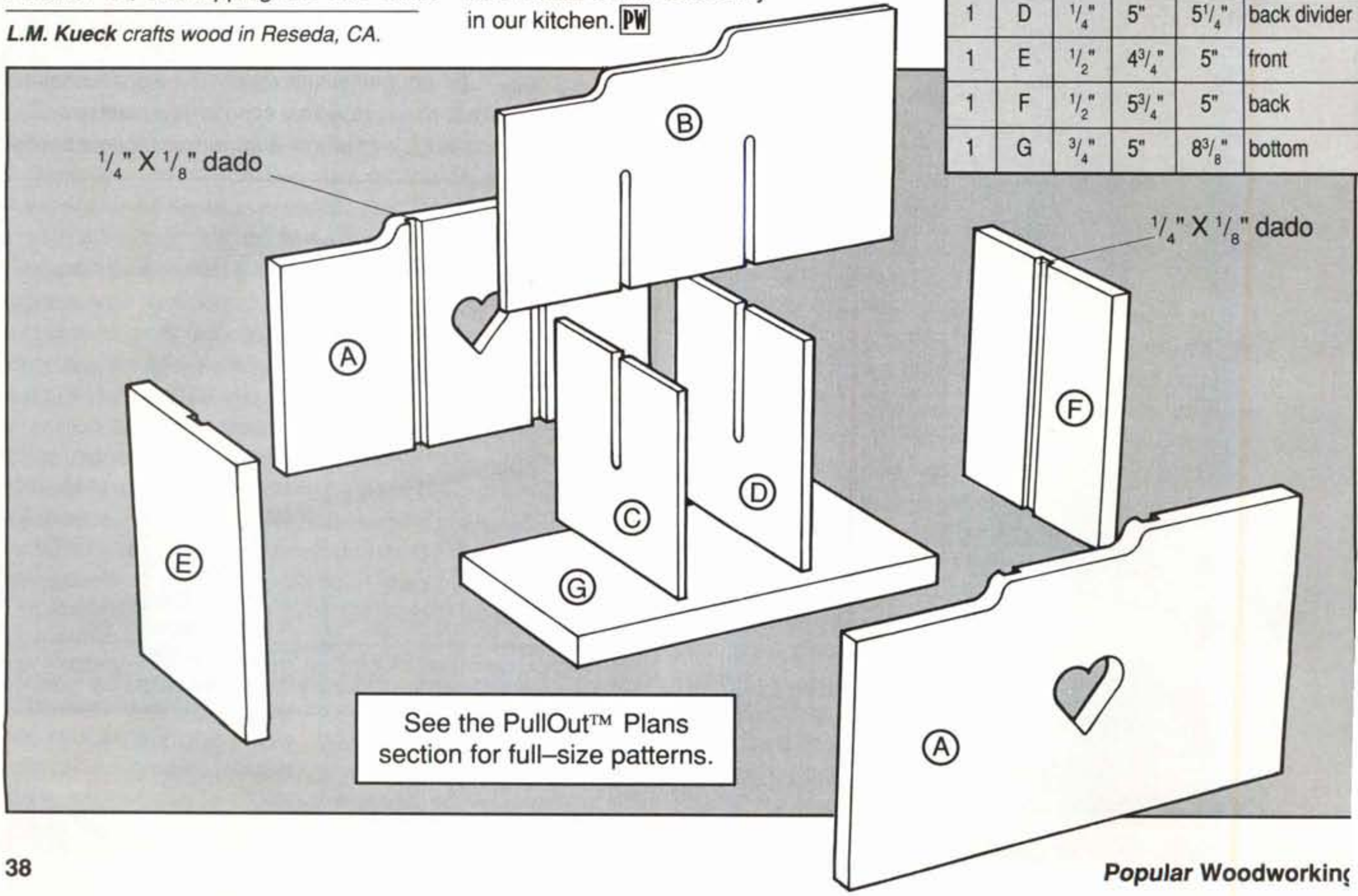
After finishing with Watco® light walnut oil, I let it dry for a couple weeks and then applied two coats of Deft® semi–gloss. With its solid yet graceful look, the cutlery box makes a fine accessory in our kitchen. **PW**

L.M. Kueck *crafts wood in Reseda, CA.*

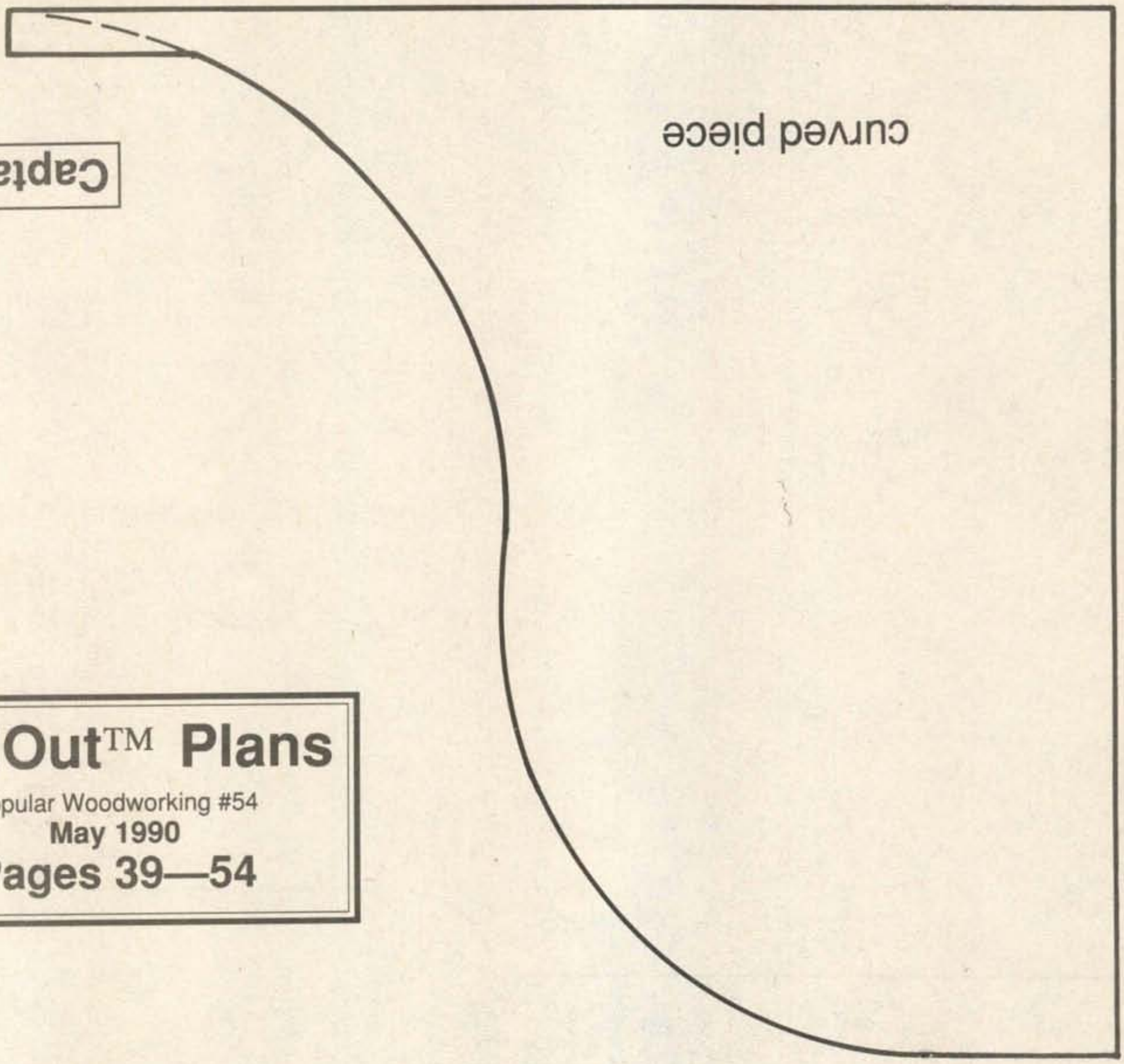
Cutlery Box

Cutting List

Qty	Part	Finished Size			Piece
		T	W	L	
2	A	1/2"	5 3/4"	9 3/8"	sides
1	B	1/4"	5"	8 5/8"	center divider
1	C	1/4"	4 1/2"	5 1/4"	front divider
1	D	1/4"	5"	5 1/4"	back divider
1	E	1/2"	4 3/4"	5"	front
1	F	1/2"	5 3/4"	5"	back
1	G	3/4"	5"	8 3/8"	bottom

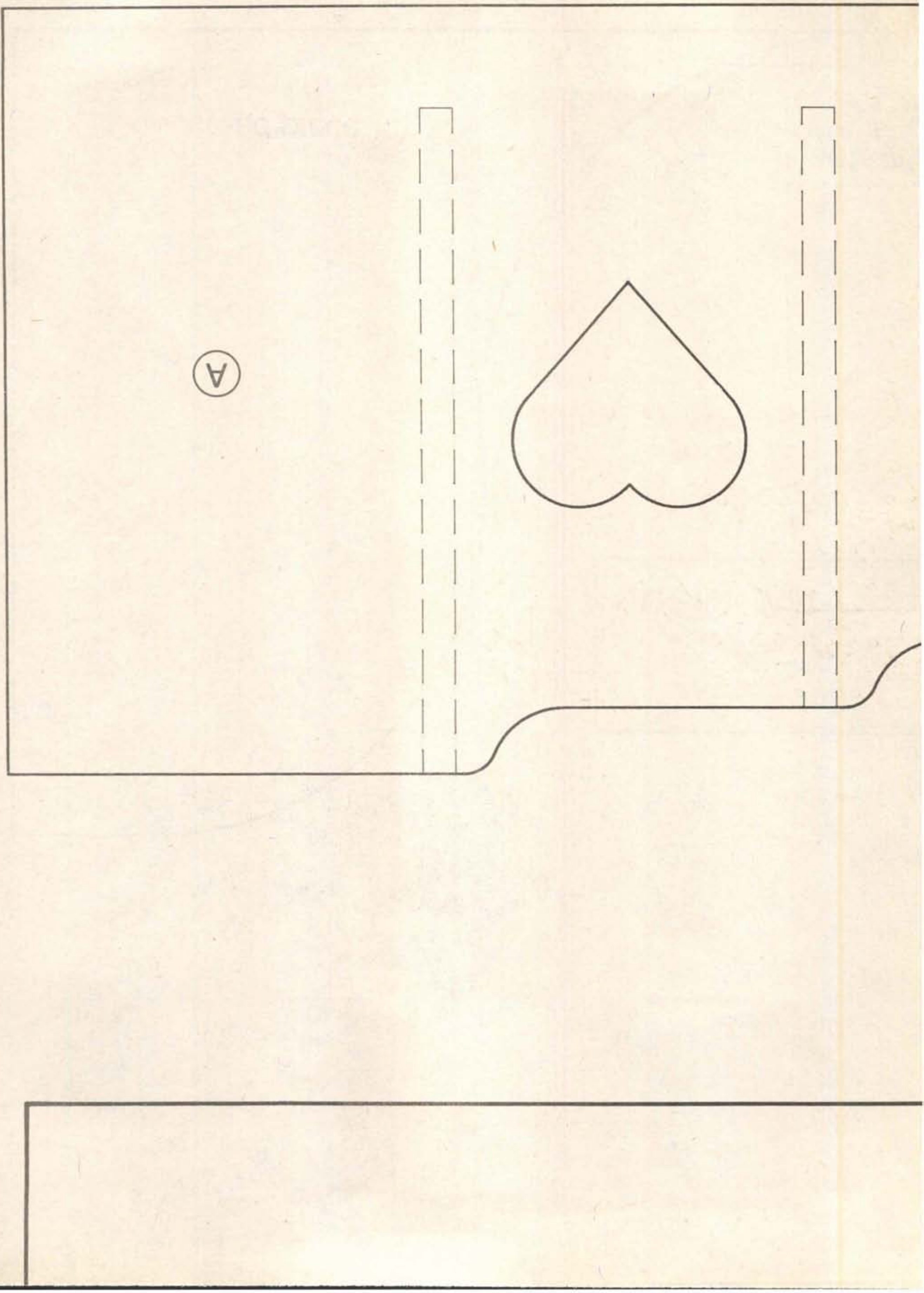


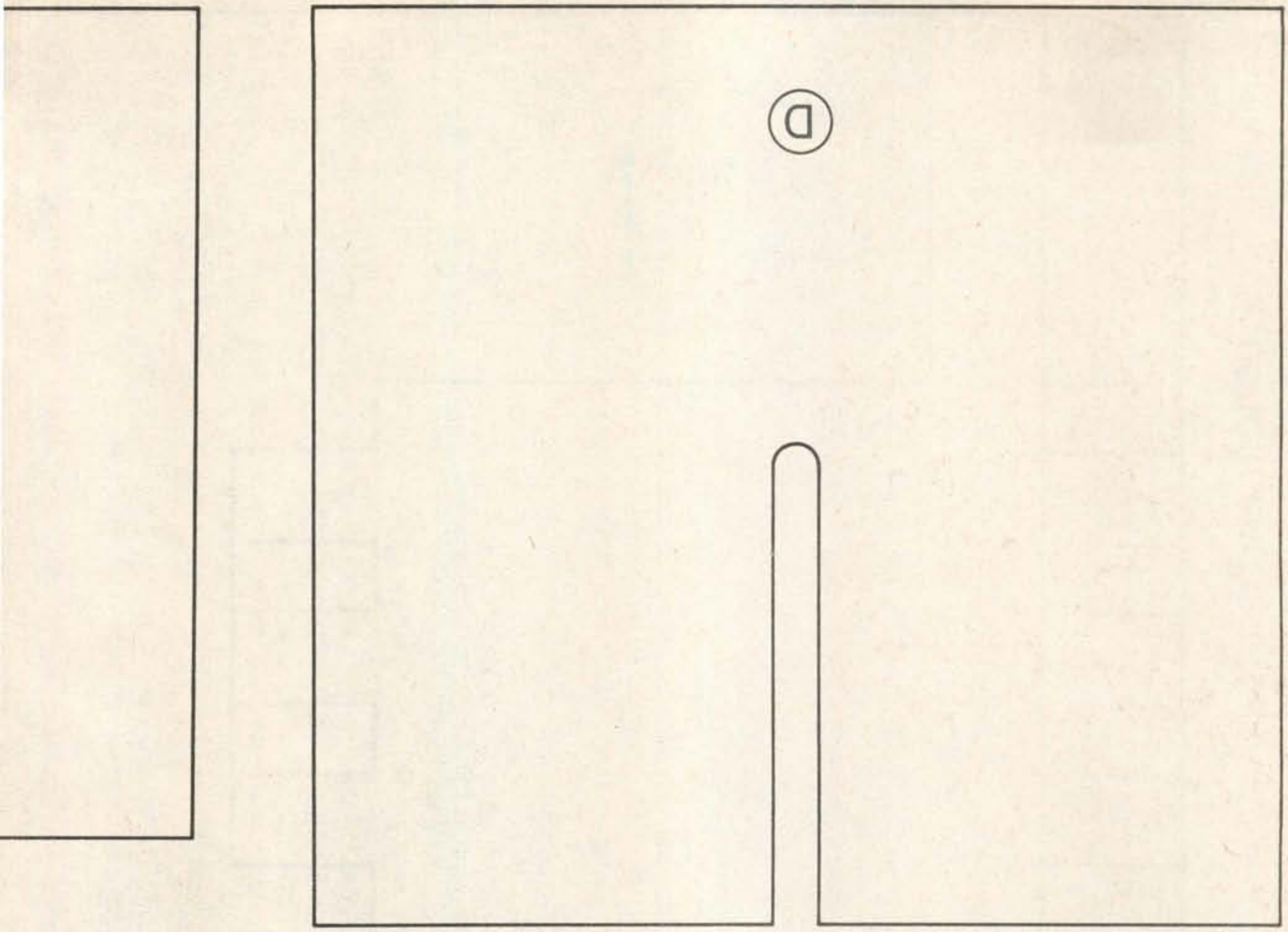
See the PullOut™ Plans section for full–size patterns.



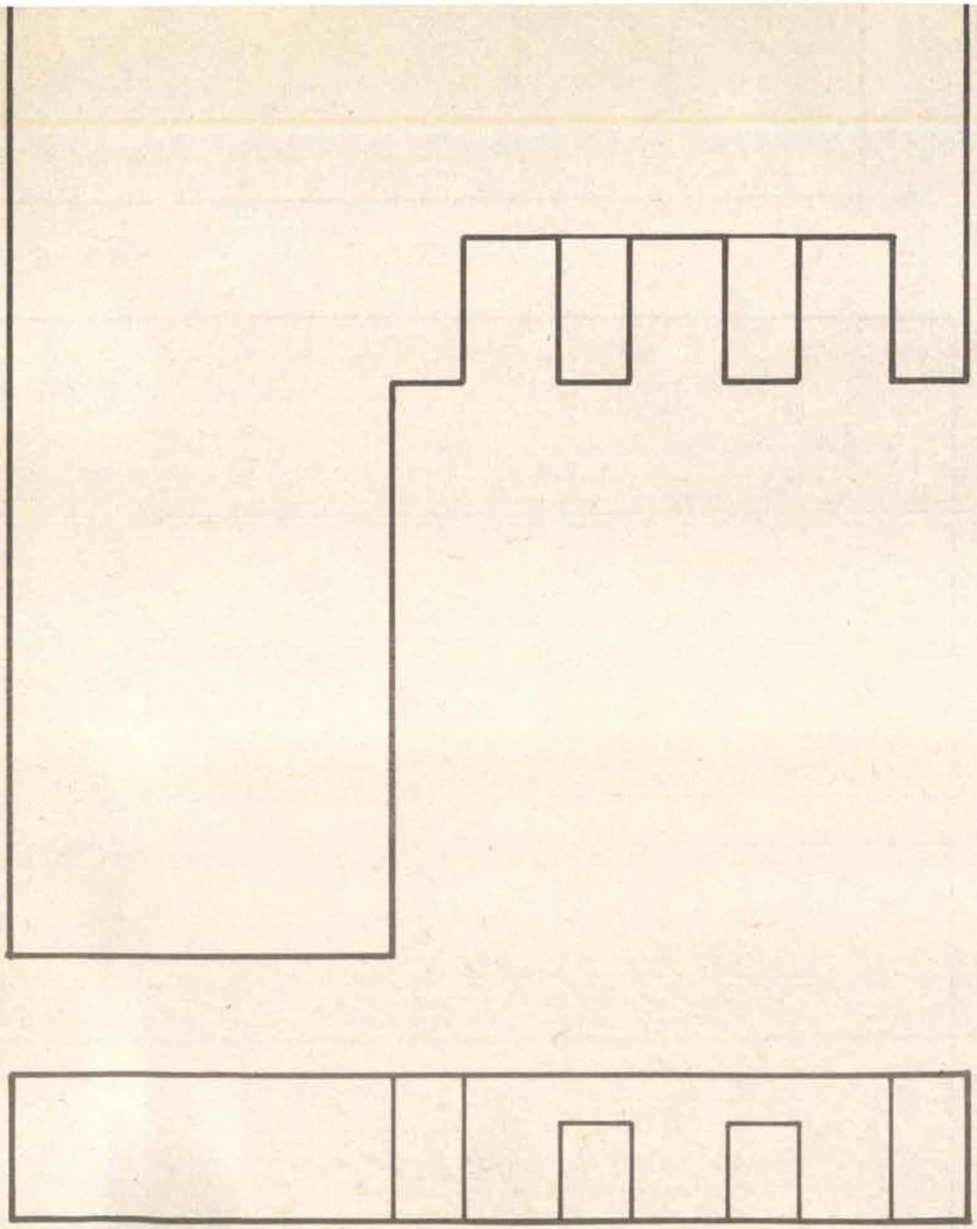
PullOut™ Plans

Popular Woodworking #54
May 1990
Pages 39—54

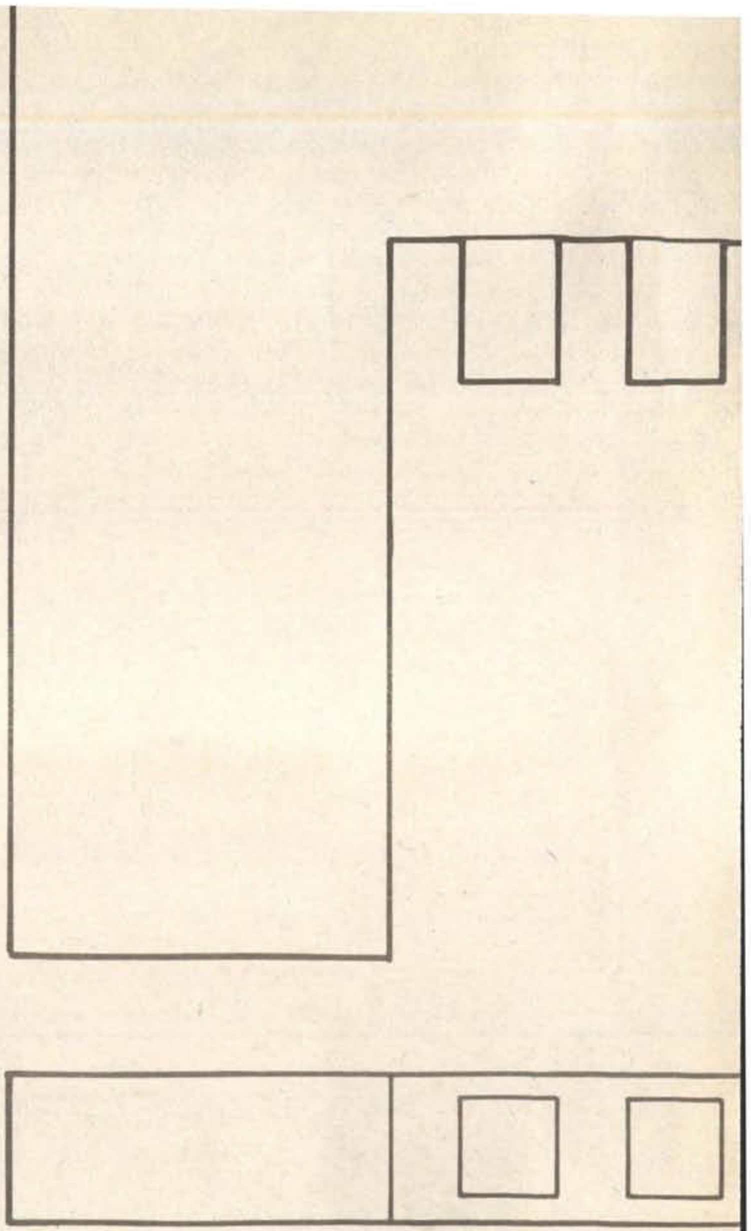

A



D



bottom end



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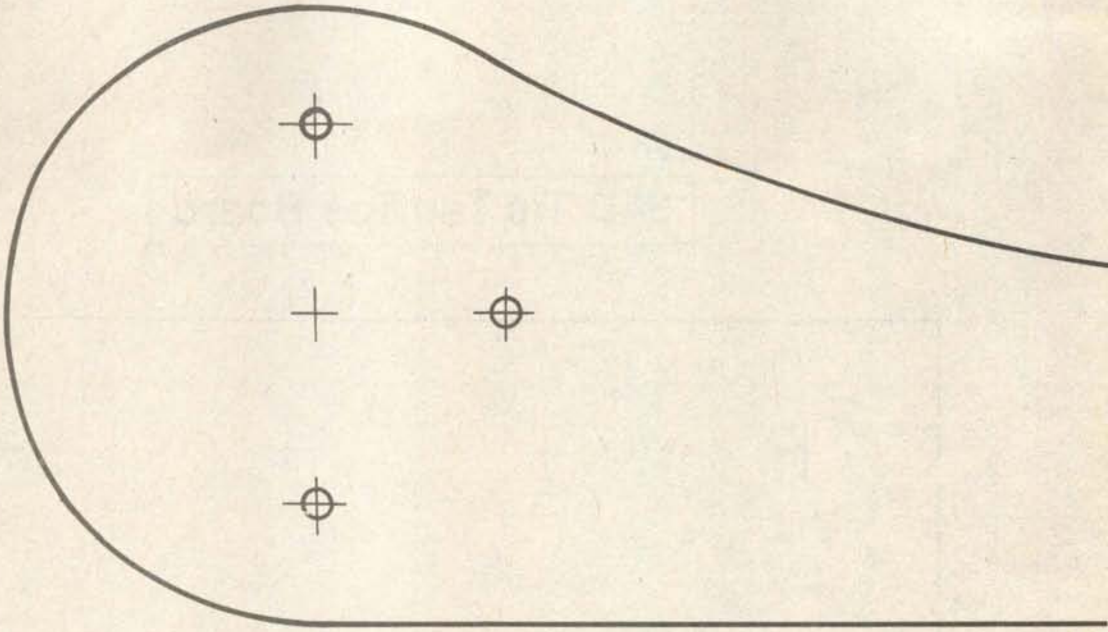
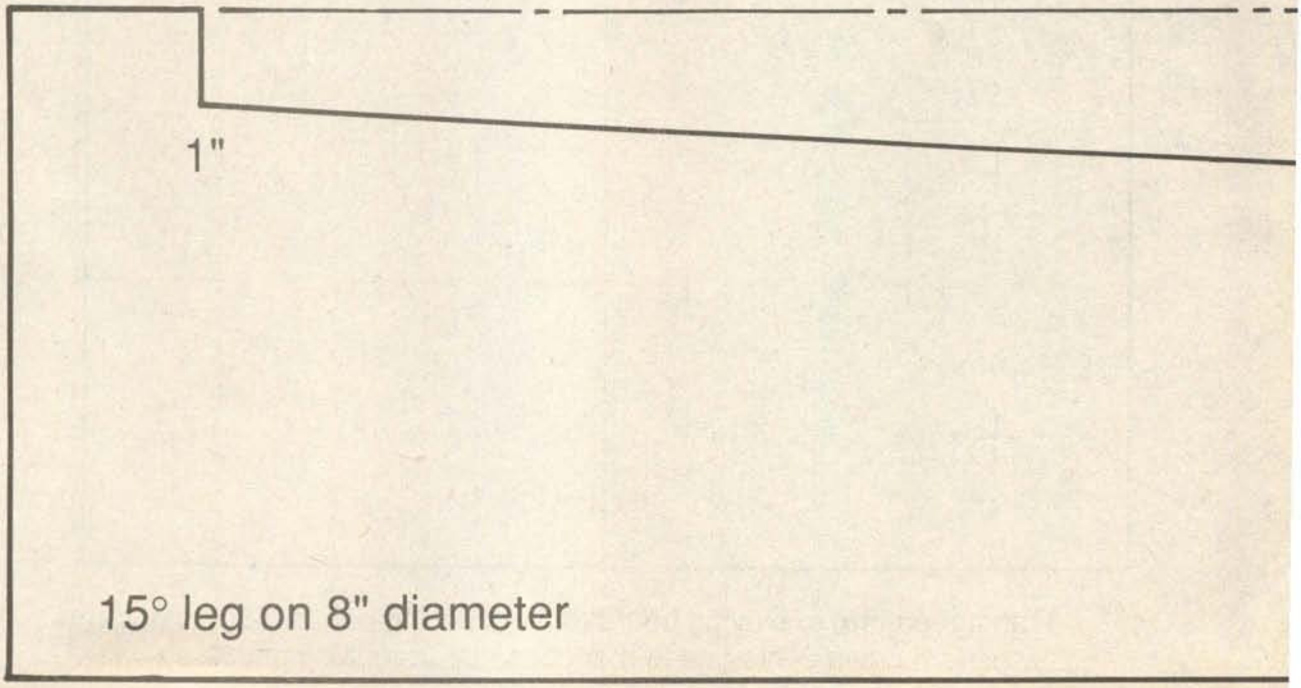
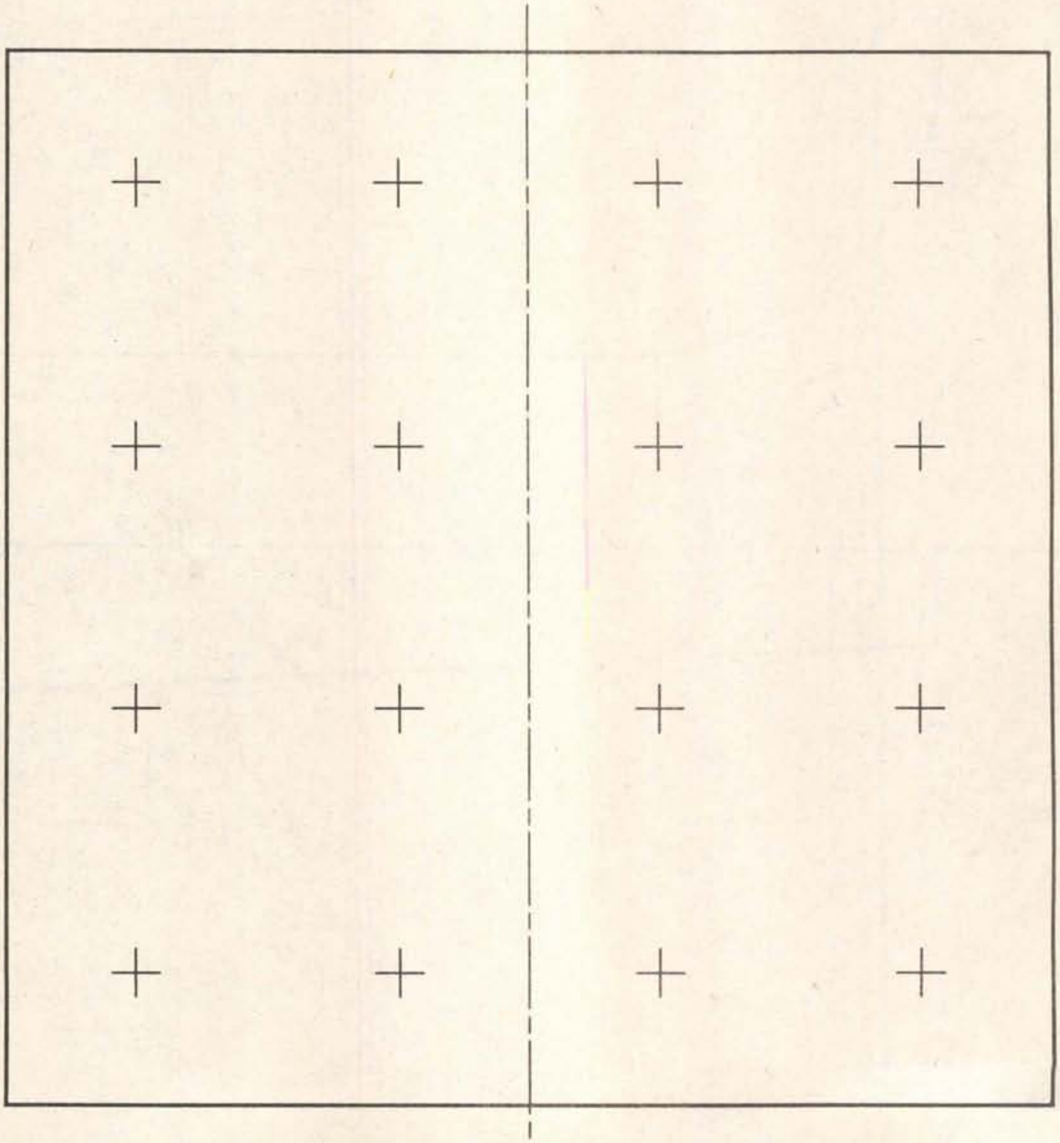
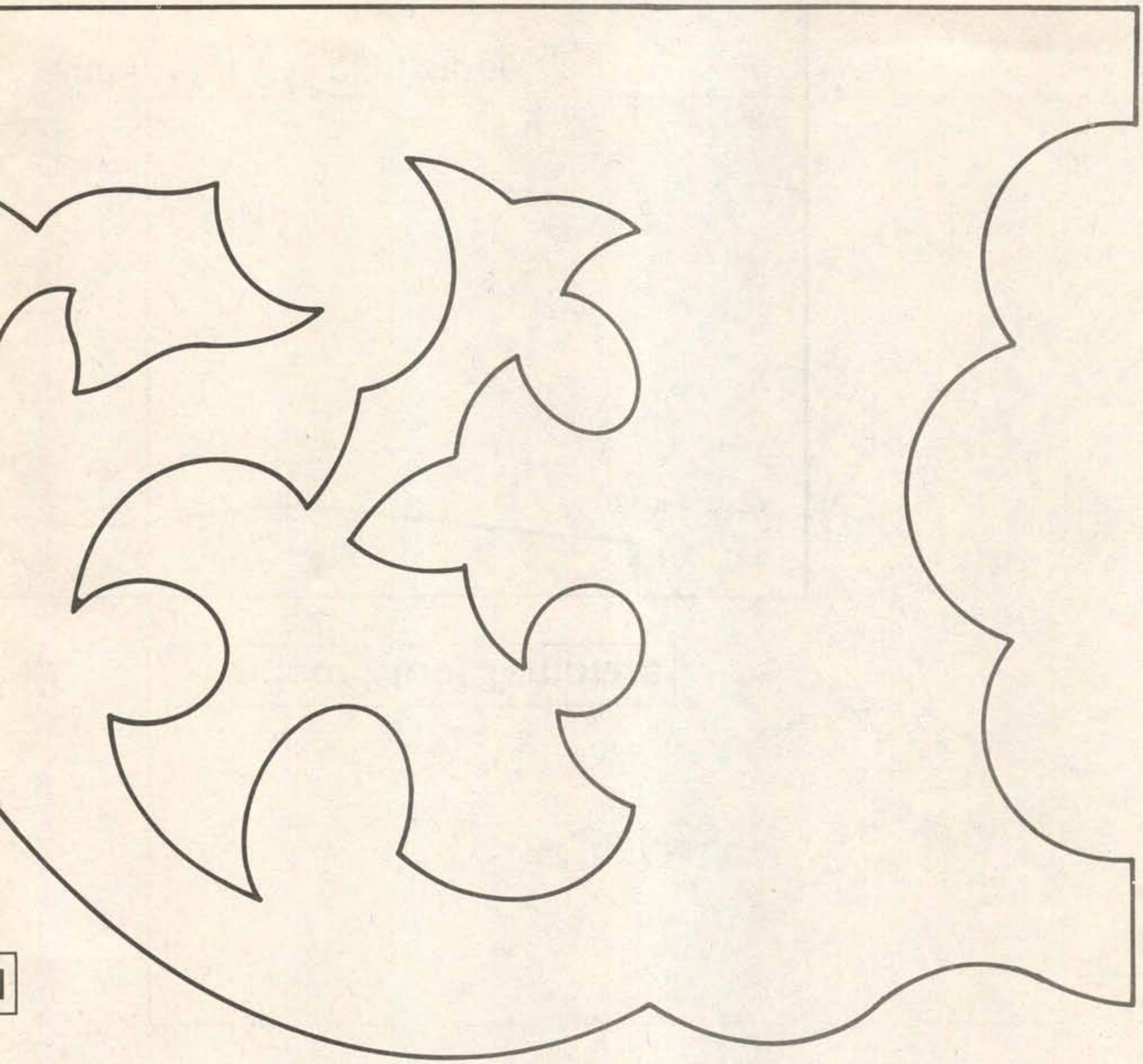


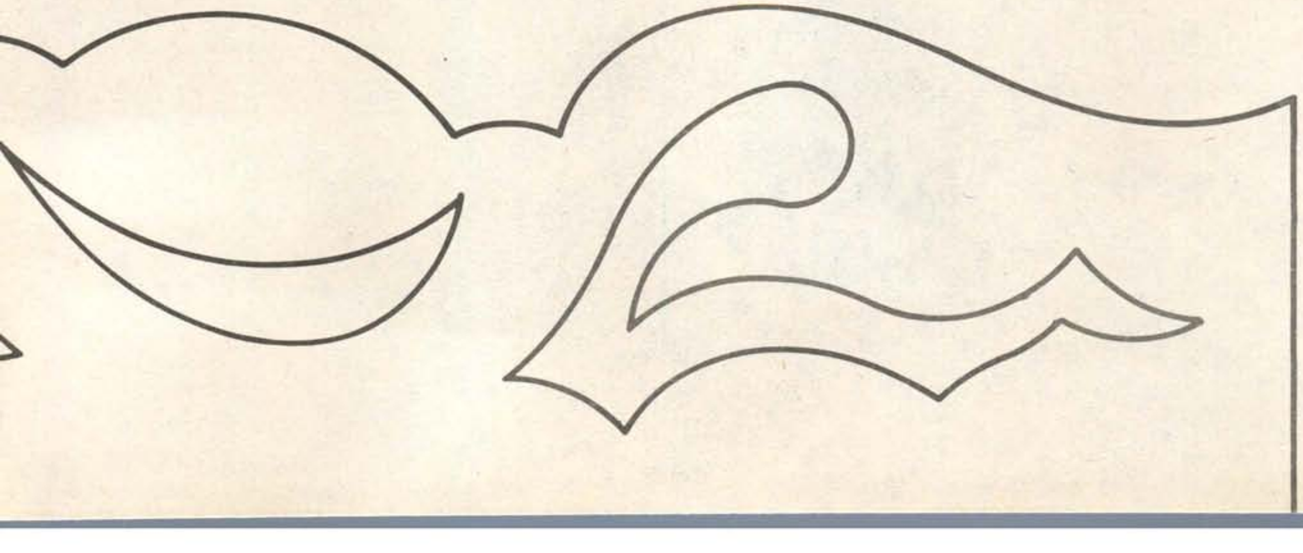

1"
15° leg on 8" diameter

3–D Tic Tac Toe Board

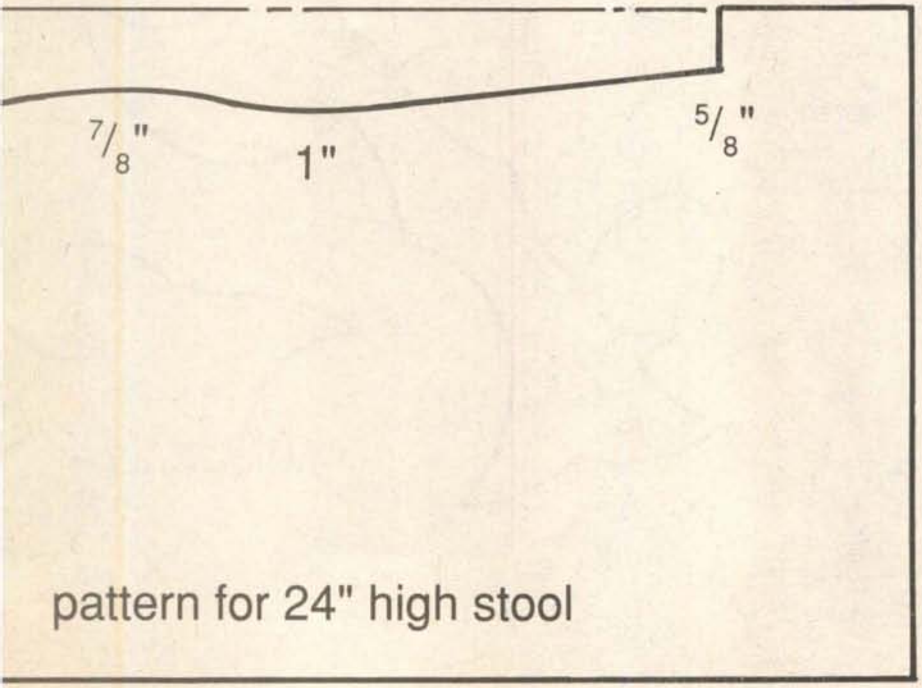


Transfer pattern to playing board to mark drilling points. Then cut pattern down centerline to mark base board drilling points.



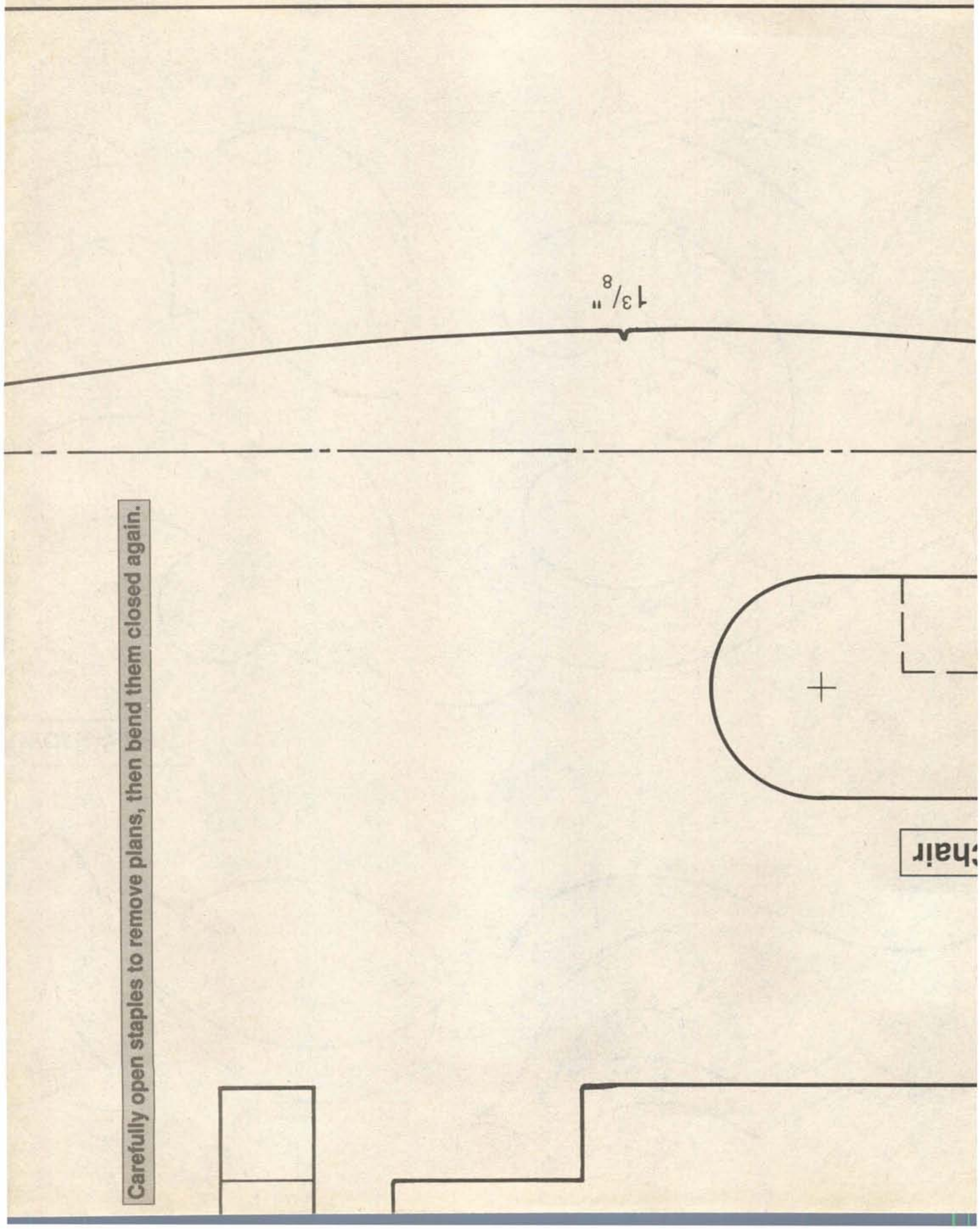


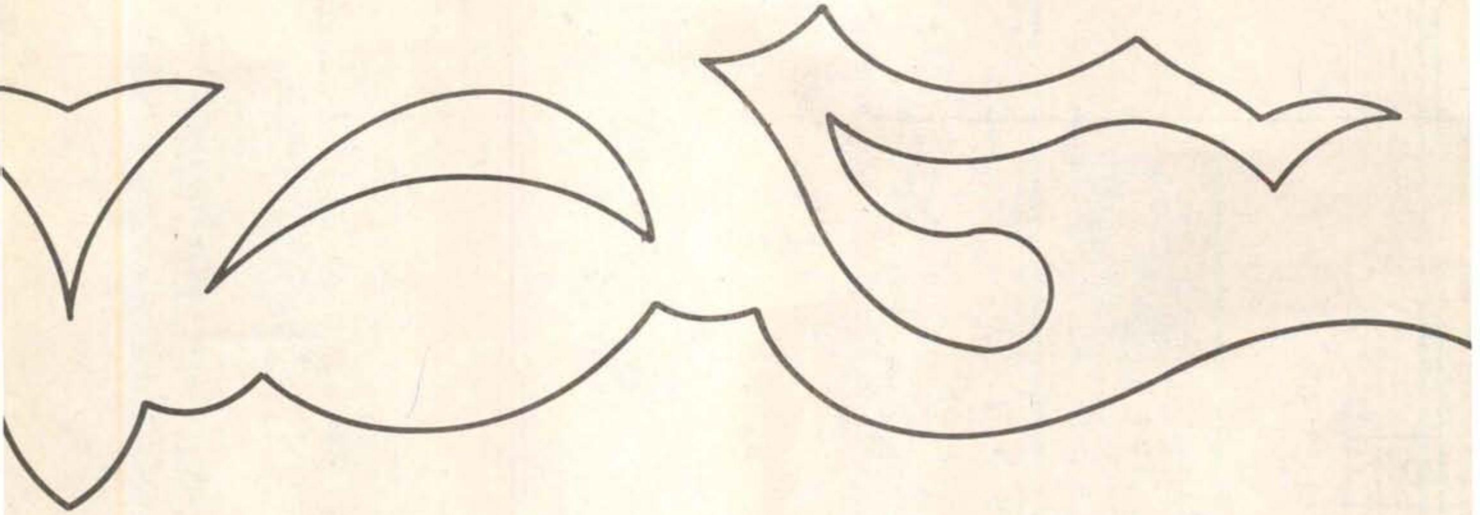
Windsor Stool Template



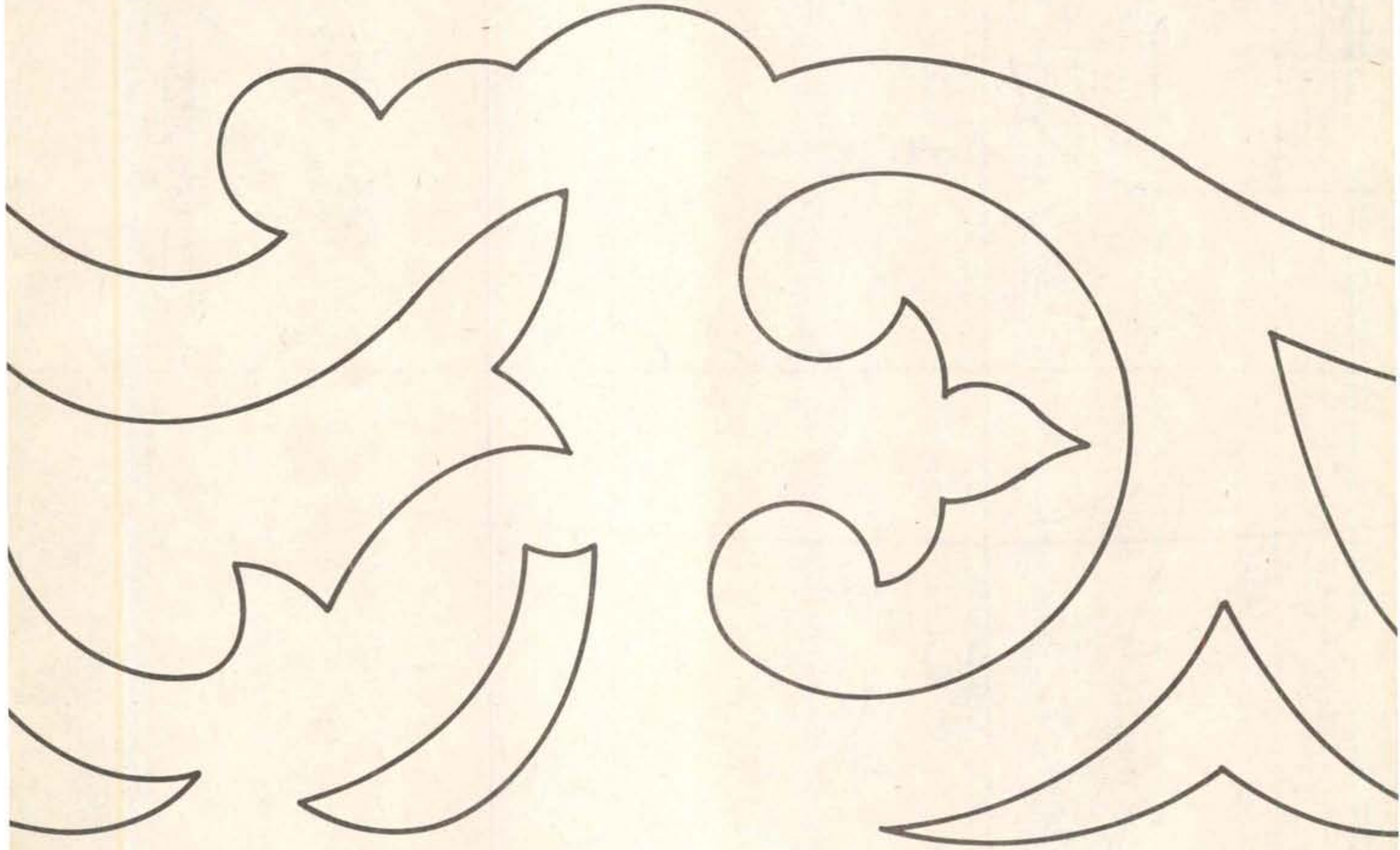
pattern for 24" high stool

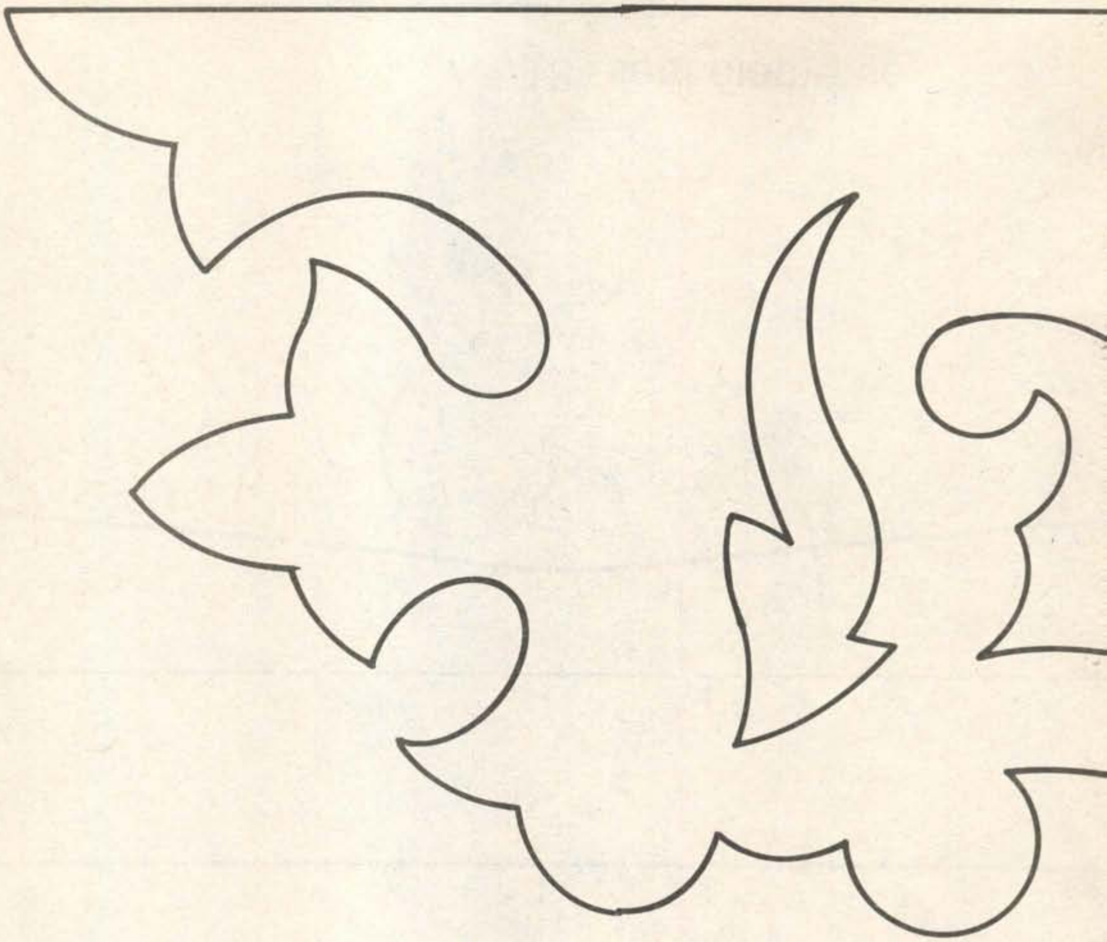
Carefully open staples to remove plans, then bend them closed again.

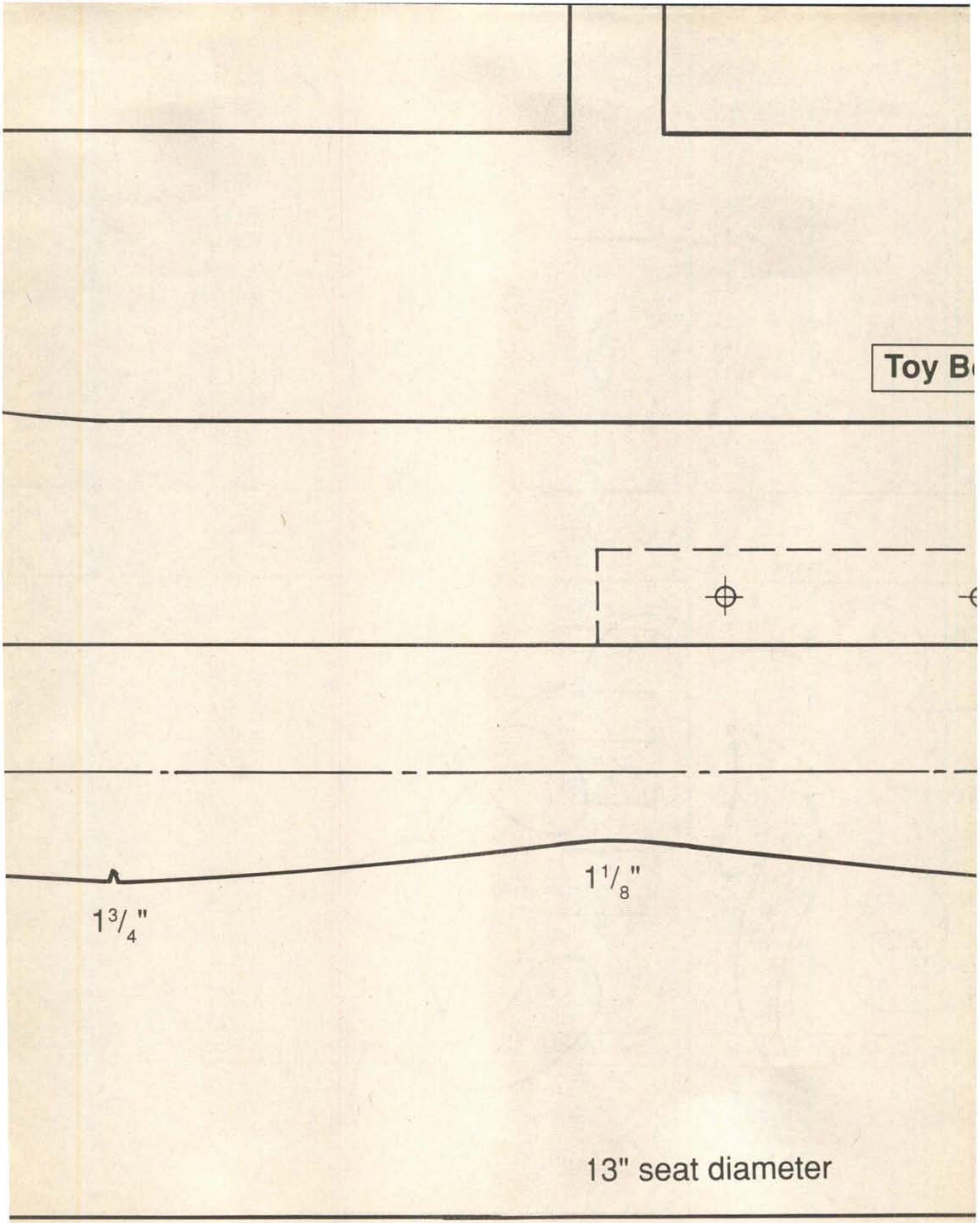


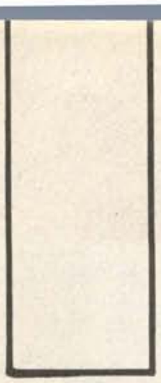


twork Shelf



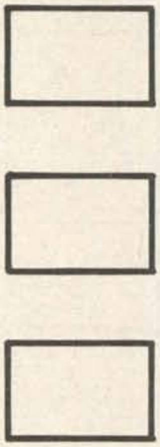



Toy B
1¹/₈"
1³/₄"
13" seat diameter



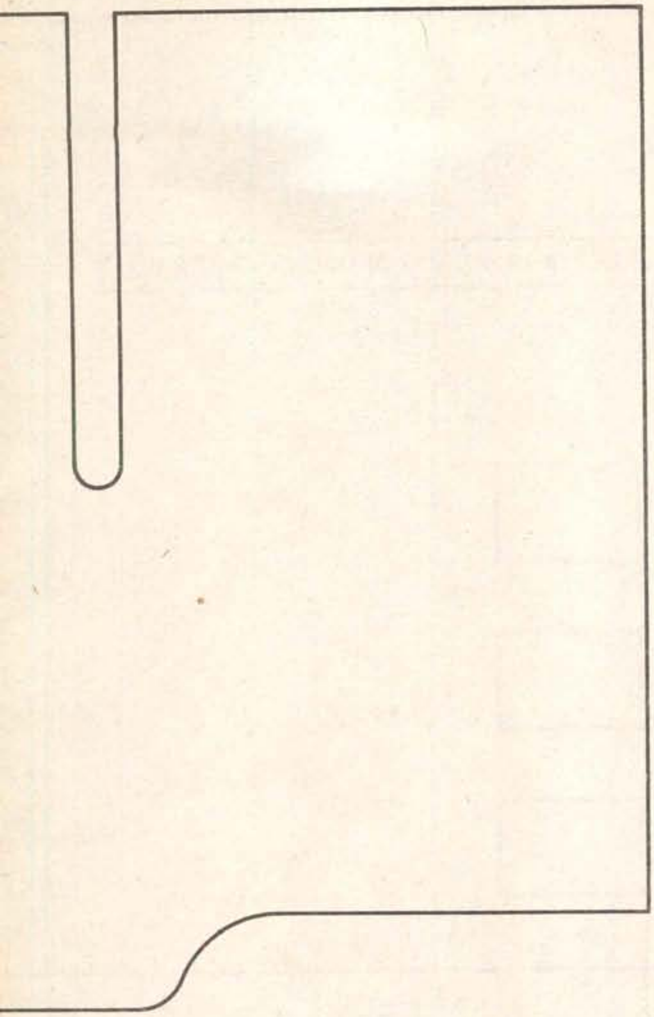
H-a

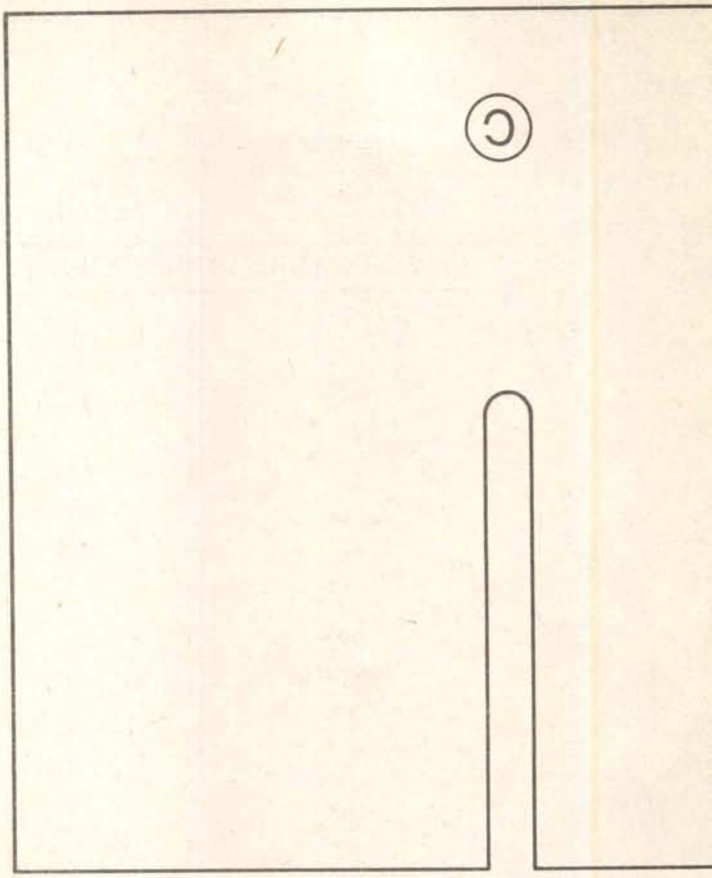
side stiles



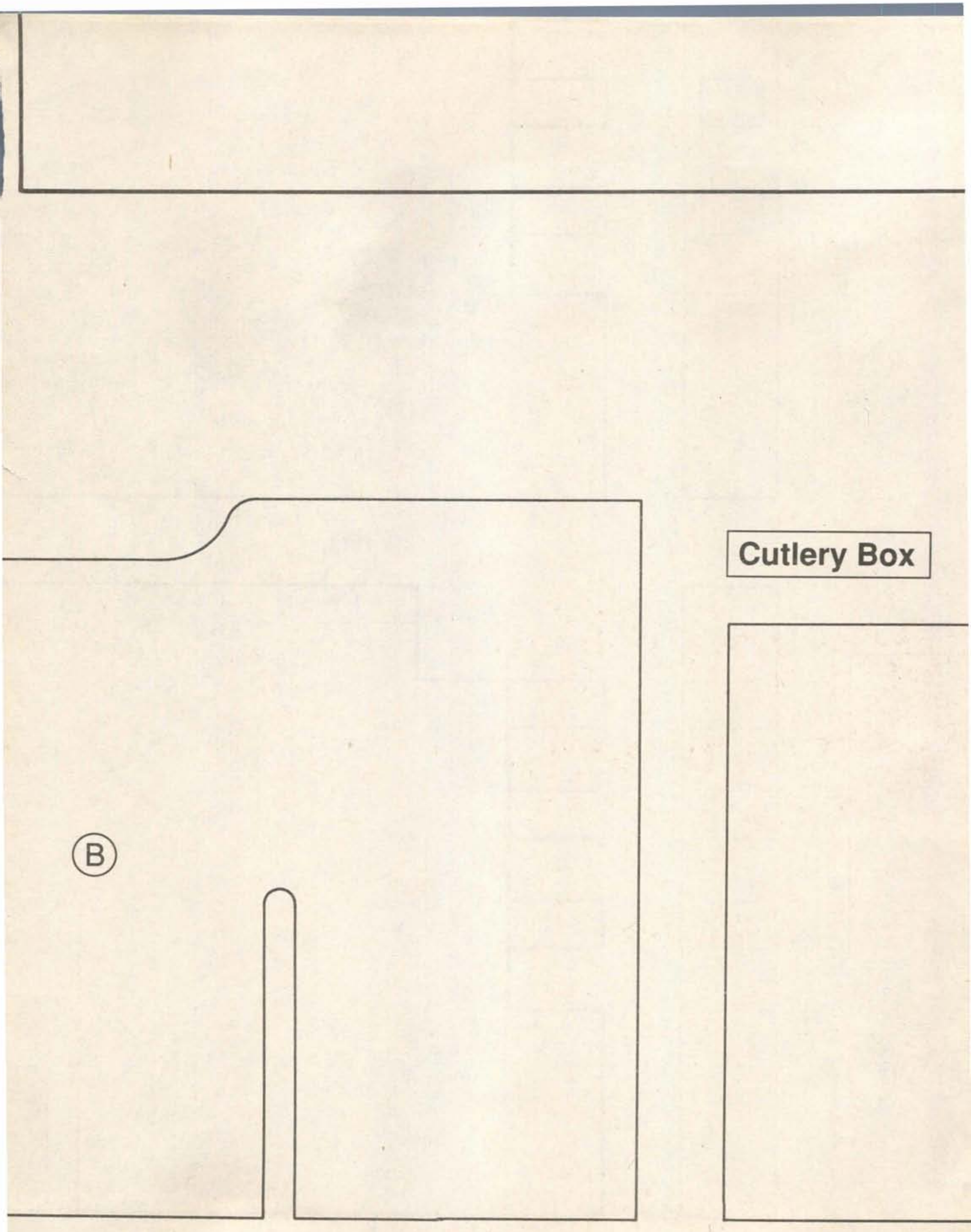
H-b

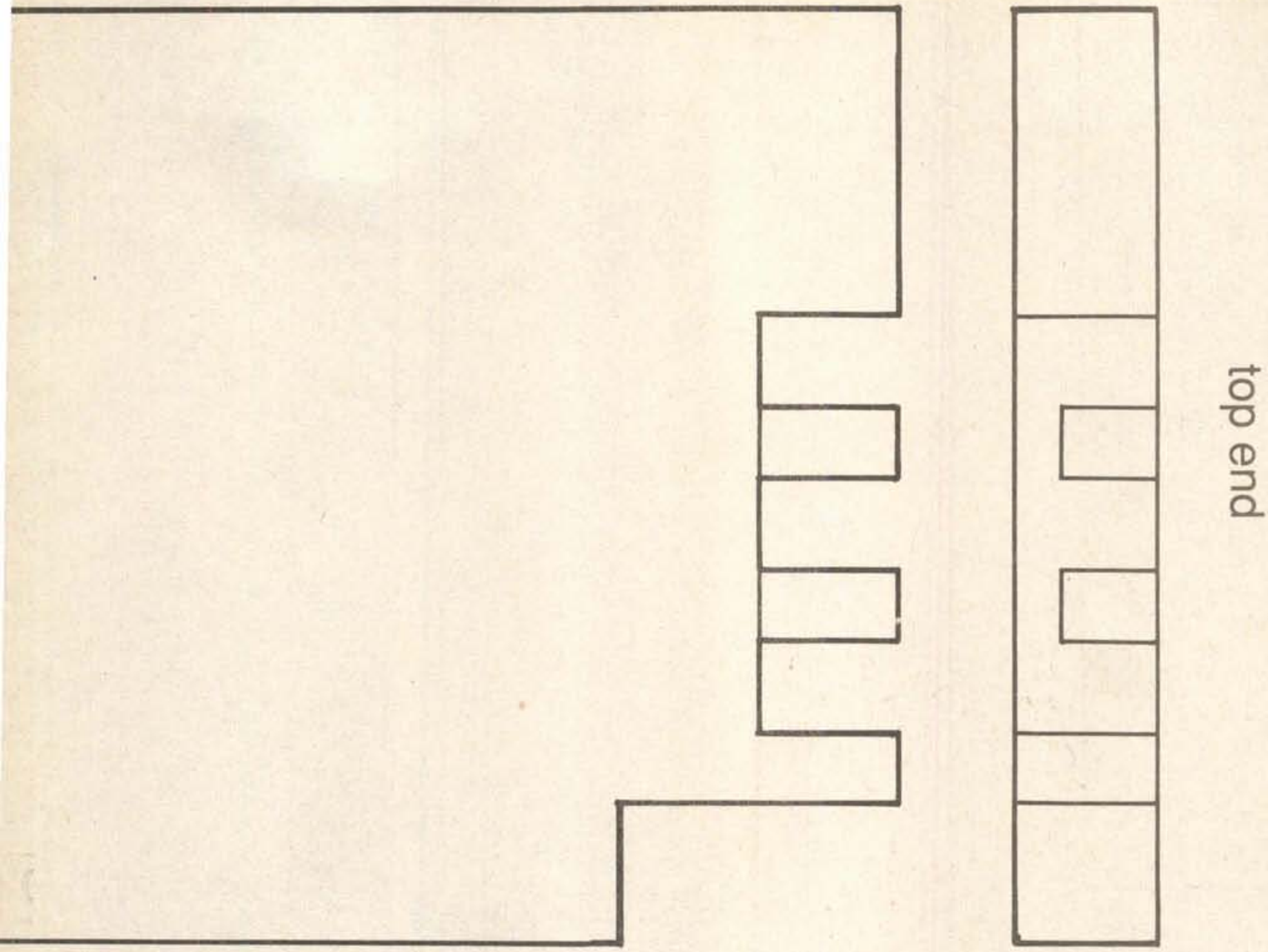
The author chose to cut the stub tenons shown here; a simpler joint would suffice.

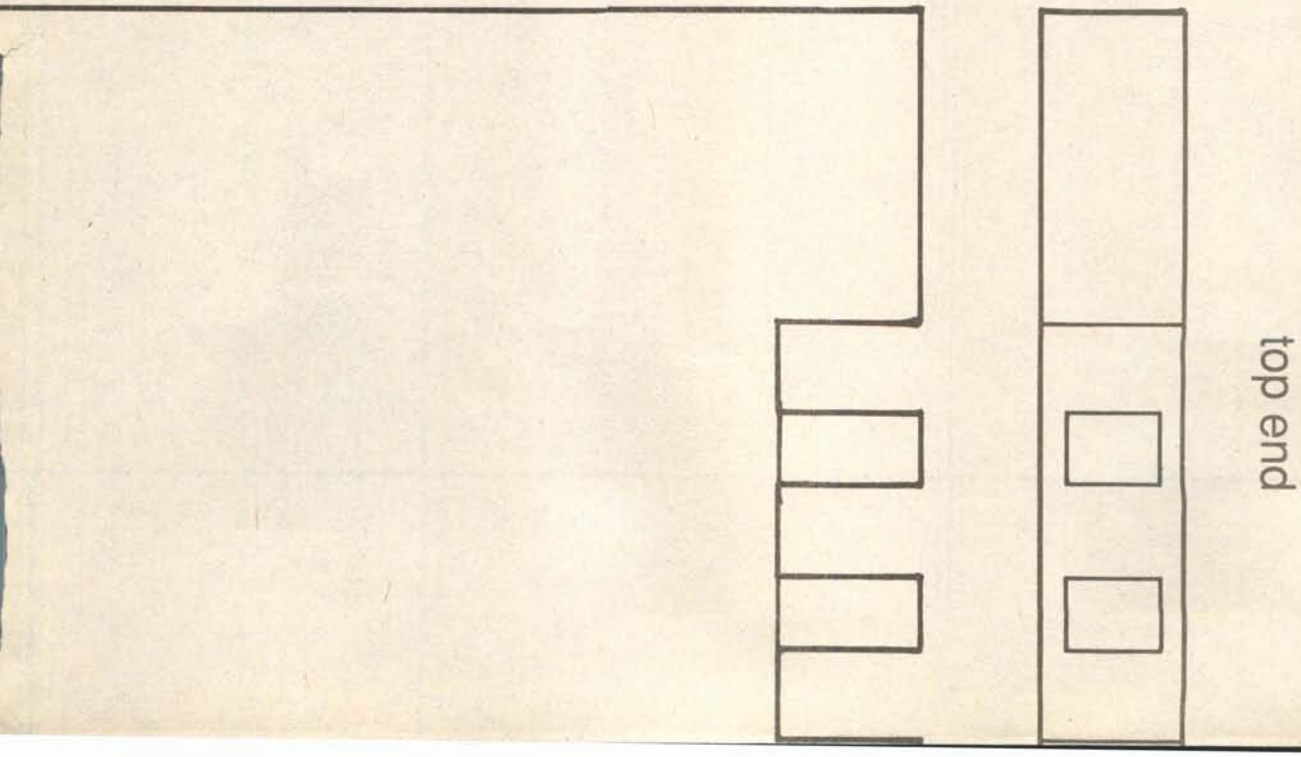




C


Cutlery Box
B


top end


top end

A Popular Woodworking Project

A Handy Step Ladder

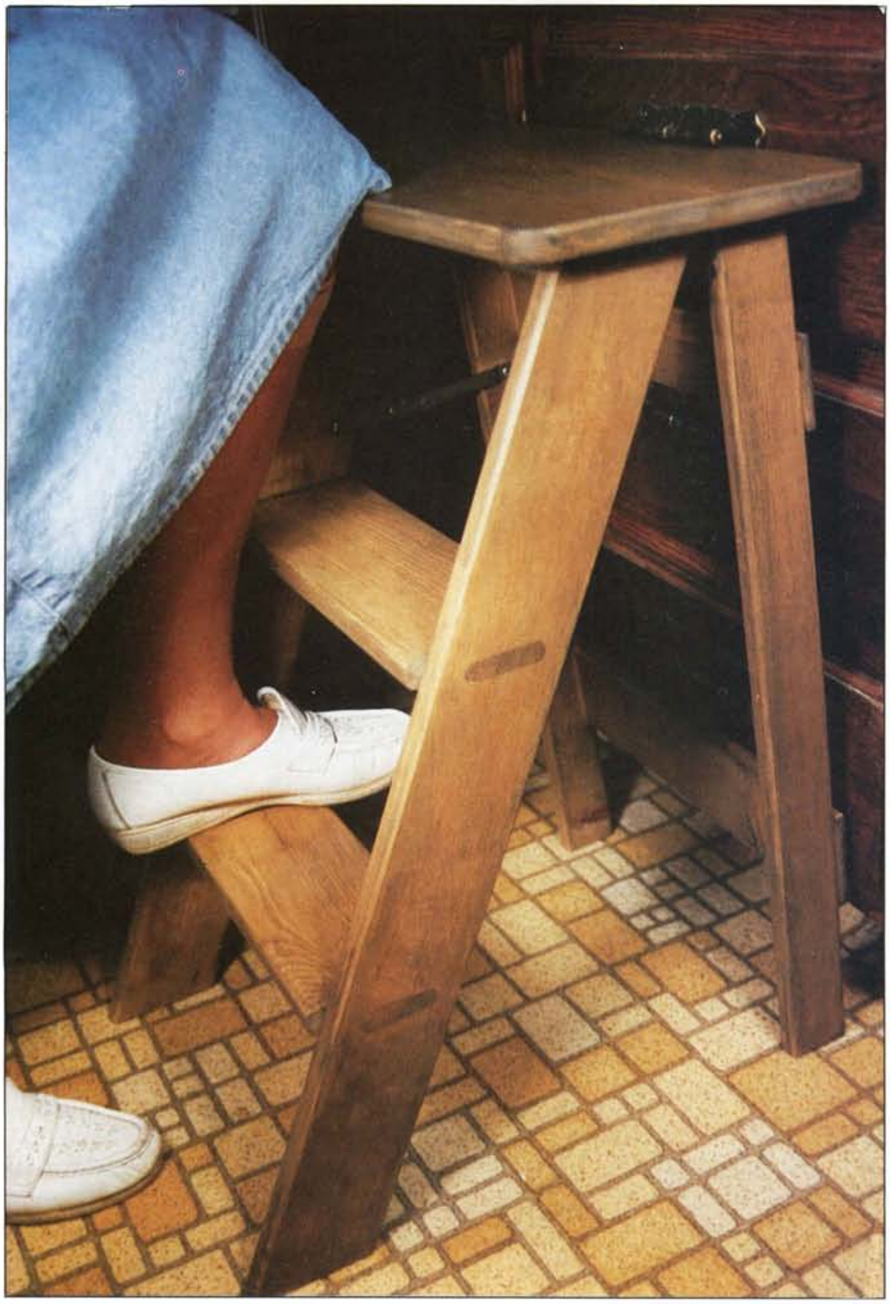
by Richard R. Steussy

Here is a piece of furniture for your kitchen that your wife will love. And even you can use it to get to those top shelves of your cupboards. I made mine out of pine, stained it "driftwood," and finished it with polyurethane. This handy ladder will look good stained to match your cabinets and will serve faithfully for many years. The ladder uses mortise and tenon joinery for sturdiness as well as good looks. It folds for easy storage and is light and easy to handle.

***Richard R. Steussy** is a hobbyist woodworker and the inventor of the Eze–Angleguide®, available from Steussy Creations, 334 Atherton Ave., Novato, CA 94945.*

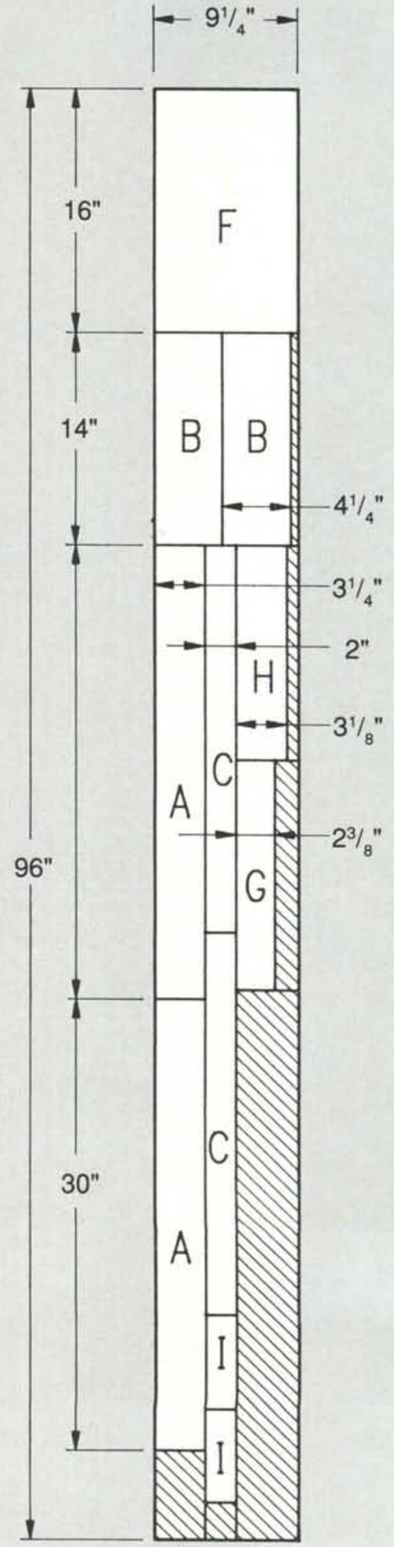
Start Cutting

Cut all the pieces to the rough sizes given in the cutting list. One eight–foot #2 knotty pine 1 X 10 will give you the right amount of material for this project, if you follow the cutting diagram shown in Figure 1.



photos by the author

Figure 1. Cutting Diagram



illustrations by Tom Larson

The author uses his Eze–Angleguide® to cut the angles on the ends of the stringers and the back legs without changing the 90° setting on his radial arm saw.

photos by the author

Now set up to cross cut at 65°. I use my Eze-Angleguide® at the radial arm saw (see the photo at left) by using templates that add up to the complementary angle of 25°. You might choose to set the miter gauge on your table saw. Trim one end of the stringers (A) at 65°; then measure from the point to the blunt end and mark the finished length of 27-1/4" at 65° (see Figure 2). Since the design calls for through-mortises to join the steps (B) to the stringers, you don't have to worry about rights and lefts. Finish-cut the back legs (C) at 87-1/2° with a length of 24-1/2" from point to blunt end (I use my 2-1/2° template).

While you're set up to cut at 65° you should make the mortise guide as shown in Figure 3. This is a simple jig made from 1/2" scrap. It has two parts: the base (D) and the fence (E). Cut them both 18" long and glue and nail them together (with nails well in from the ends). Trim one end of the jig at 65° such that the blunt end is on the side with the fence attached.

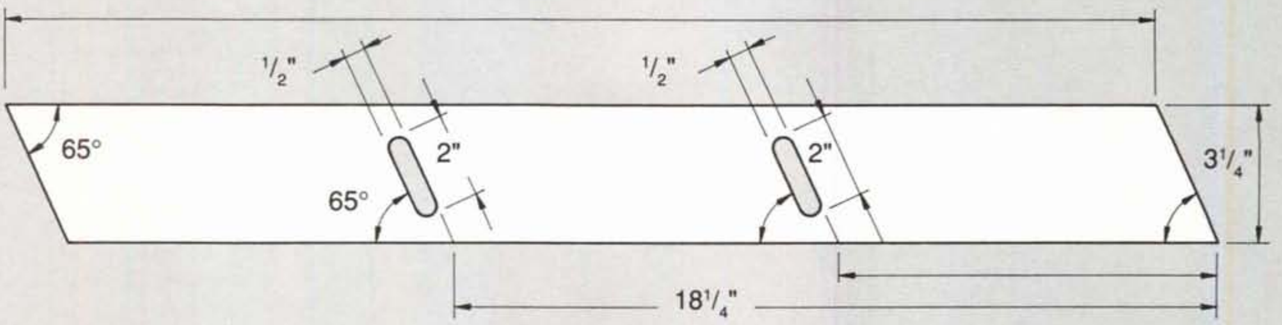


Figure 2. Layout of the Leg

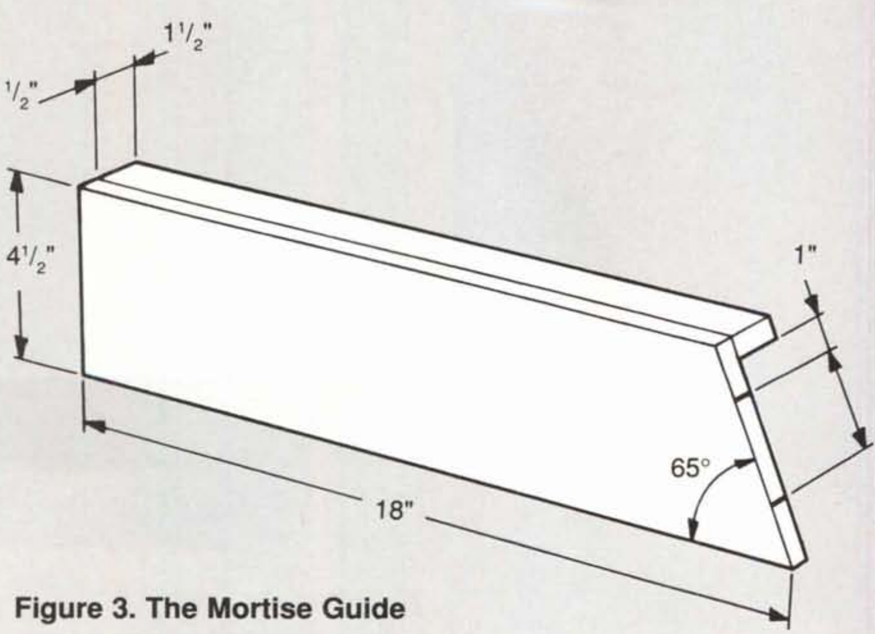


Figure 3. The Mortise Guide

illustrations by Tom Larson

This jig is used for marking the mortises and also routing them. To lay out the mortise on the jig, place it on the table with the point to the right and towards you. Measure 1" and 3" from the blunt side of the angle towards the point. Make vertical marks across the end of the jig from top to bottom at those points (see Figure 3).

Stack both stringers (A) on the table with the pointed side to the right and towards you. Mark this as the top end. Measure and mark 9-1/8" and 18-1/4" from the point of the stringer (see Figure 2). Place the jig on top of the stringers with the fence away from you and overhanging the stringers. With the angled edge of the jig positioned at the 9-1/8" mark, mark the length of the mortise across the stringers. Move the jig 1/2" to the left and draw a line that is parallel to the first line. Finally, mark lines perpendicularly from those on the edge of the jig. This will show the exact outline of the mortise. Repeat this procedure at the 18-1/4" mark.

You will use these marks as your guide when cutting the mortise with your router. Chuck a 1/2" straight bit in your router, and measure the distance from the edge of your router base to the edge of the bit. (Mine measured 2-7/8" from edge of base to edge of mortise.)

Place the two stringers and the jig on top of a scrap piece to protect your work table. Line up the stringers and clamp the jig at the right distance from the mortise edge.

Using the end marks of the mortise as the starting place, plunge the router into the cut. Gradually go deeper with each pass until you get through both stringers and into the scrap.

Making the Steps

Cut the steps (B) to finished size according to the cutting list and lay out the tenons as shown in Figure 4. Set the table saw fence to 3/4" from the *outside* of the blade. Lower the blade to make a 1/8" deep cut for the shoulders on each end of the steps. Make a pass on each face at each end, holding the workpiece against the miter gauge.

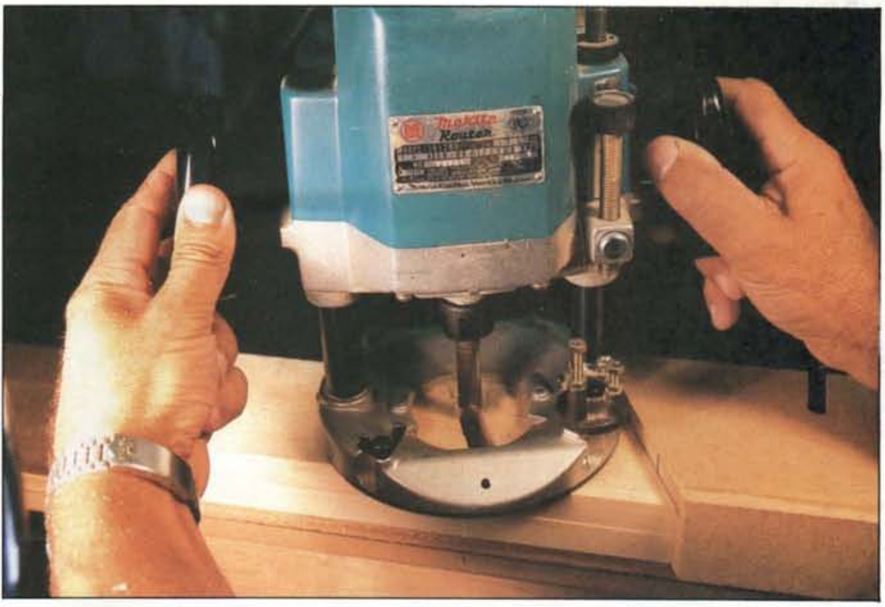
Next, raise the blade to 3/4" and set the fence to 5/8" on the *inside of the blade*. Pass each piece through on each end twice to cut the cheeks. This should result in a 1/2" thick tenon.

Now reset the saw fence at 1-1/8" to the *outside* of the blade. Running the steps (B) vertically through this setup, with each edge against the fence, should result in a 2" wide tenon.

It is wise to use scrap to determine the correct saw setups, and do not cut your pieces until you are sure that the width of the tenon you leave is correct to fit the mortise. After sawing the tenons, round them carefully with a strip of sandpaper until they fit the mortise tightly. Dry-fit the tenons into the mortises, and mark them for reference (where the marks won't show).

Final Preparation

Round the corners of the top (F) (I use a 6 oz. tomato paste can lid as a pattern). Cut a 3/8" deep X 3/4" wide rabbet across the ends of the upper and lower cross pieces (G and H) as shown in Figure 5.



photos by the author

Use the mortise guide jig for marking the start and stop points of the mortise; than clamp it in place to guide the router and plunge–cut the mortise in both stringers simultaneously.

Now put a 1/4" pilot roundover bit in your table-mounted router and rout all the pieces with a slight bullnose effect. Do not round the stringer ends and rout only three edges on one side of the glue blocks (I). Then use a pad-sander to do a thorough job of sanding all the parts.

After assuring that your steps will fit the stringers, spread glue carefully on only the tenons. Use two pipe clamps on each side at each joint, and draw the stringers together evenly. After a few minutes, clear excess glue from the joints with a triangular scraper. I find that a cabinet scraper removes dried glue cleanly so stain will take. Use a belt sander to sand the ends of the tenons flush.

The next step is to join the glue blocks (I) to the top ends of the stringers. I used a biscuit joiner. I secured the stringer assembly in my vise and clamped a glue block to the inside end, flush to the top. Align the lower corner of the block with the blunt edge of the stringer as shown in Figure 5. Mark a line across the end of the stringer and onto the adjoining surface of

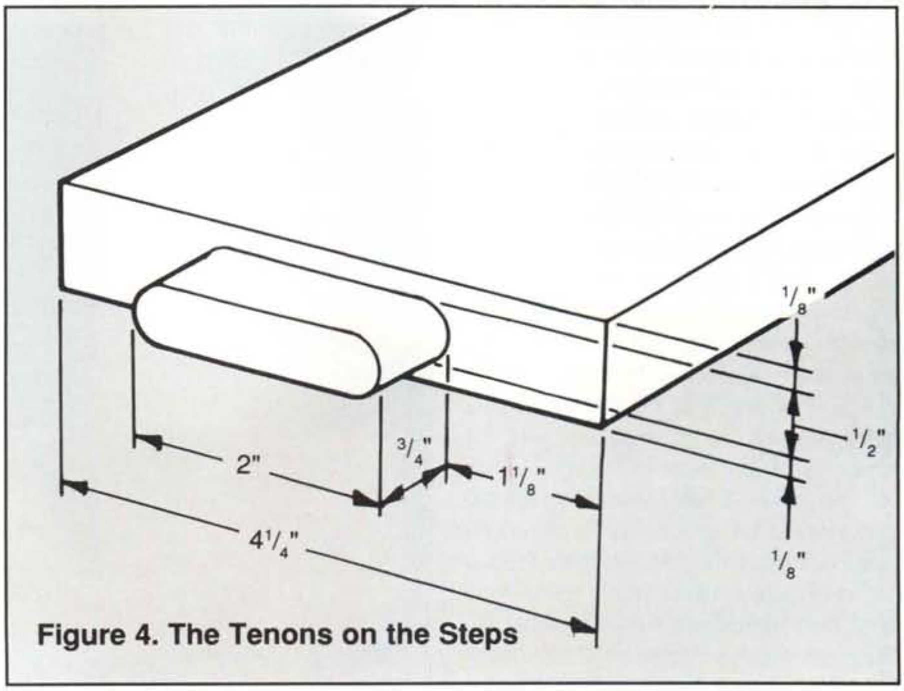
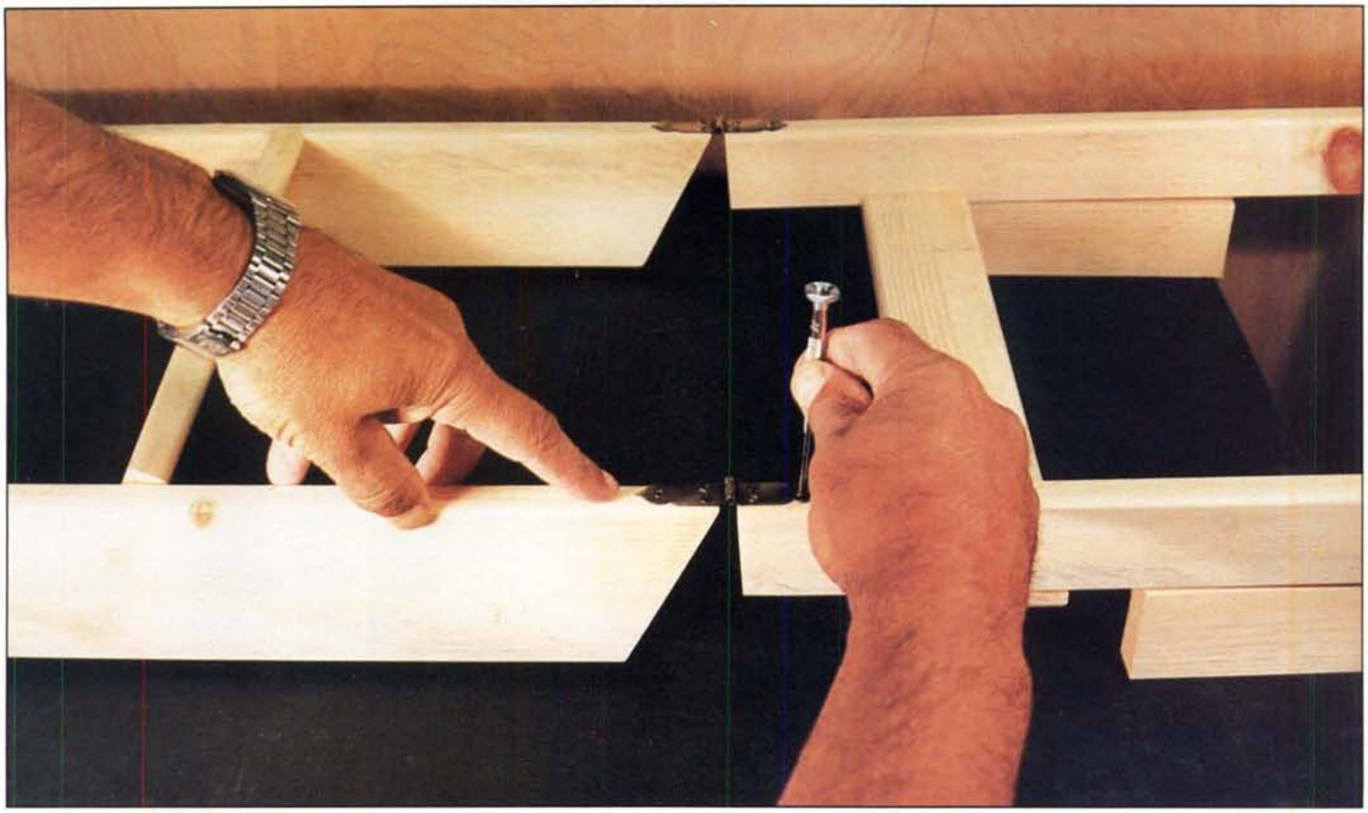


Figure 4. The Tenons on the Steps



Position the hinge with the spine just past the point on the end of the stringer and facing up. Use scrap wood ripped to the right width to prop the back leg assembly up flush with the back of the stringers.

the glue block; use this as the reference mark for your biscuit joiner. If you don't have a biscuit joiner, drill pilot holes and countersink for screws in the stringers. but don't assemble these pieces permanently yet.

Assemble the back legs and their crosspieces as shown in Figure 5. Use glue and countersunk drywall screws.

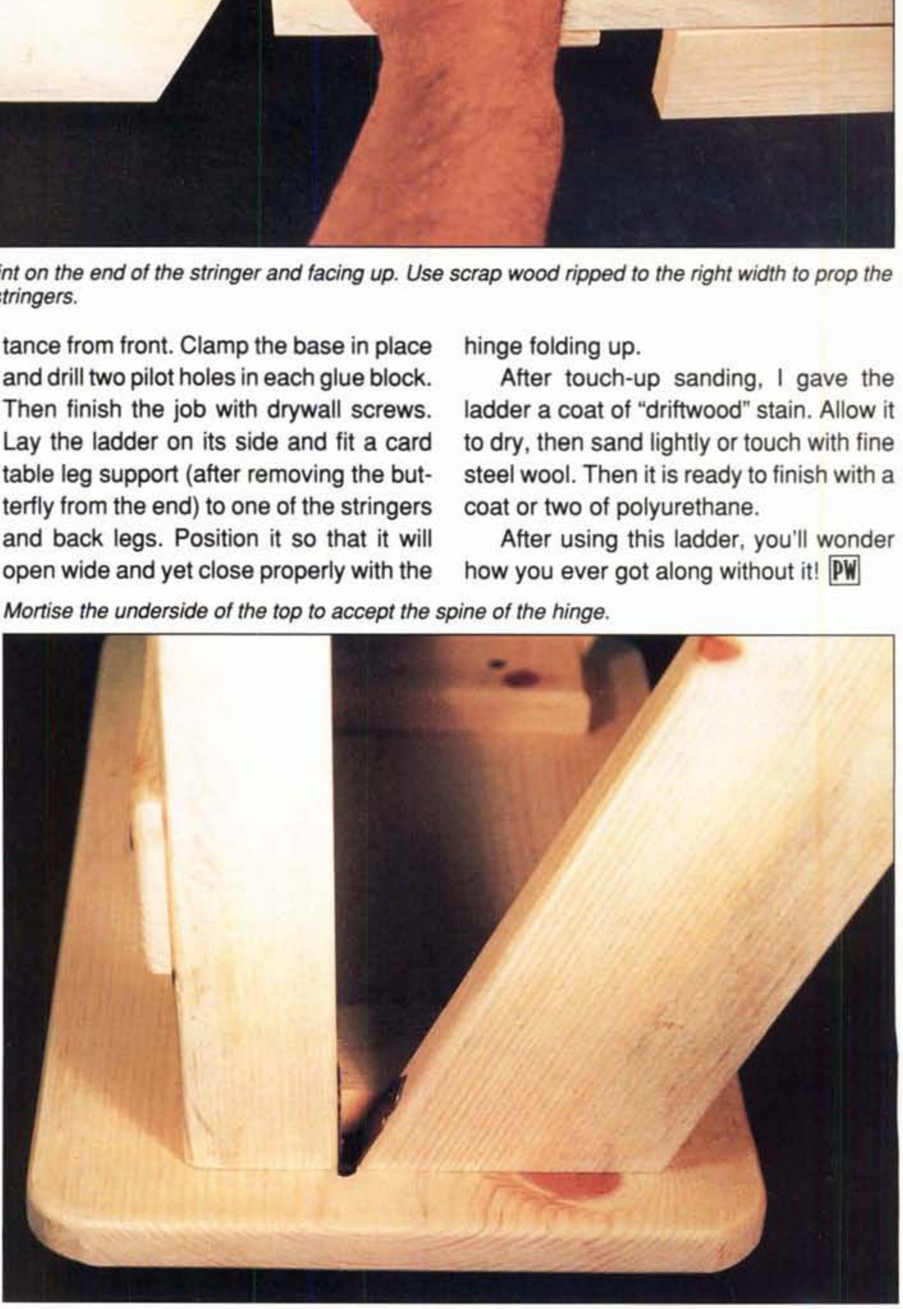
Now you are ready for the hinges. I used Brainerd #9102, 9/16" wide antique brass hinges. Lay the hinge on the pointed edge of the stringer with the spine of the hinge facing up and hanging just off the point. Mark and drill the three pilot holes and attach the hinge with screws. Attach the other hinge the same way. Next, place some 1-1/2" wide scrap under the back legs to shim the assembly up flush with the stringer assembly so you can attach the remaining hinge leaves. Now you can glue the glue blocks (I) to the stringers using either biscuits or screws, and set the whole assembly aside to dry.

The last step before attaching the top is to rout two 1/4" grooves on its underside to accept the spines of the hinges. The top view in Figure 5 shows their location. Now position the hinges from the assembly into the grooves. You should be 1" from each side and the grooves determine the distance from front. Clamp the base in place and drill two pilot holes in each glue block. Then finish the job with drywall screws. Lay the ladder on its side and fit a card table leg support (after removing the butterfly from the end) to one of the stringers and back legs. Position it so that it will open wide and yet close properly with the hinge folding up.

After touch-up sanding, I gave the ladder a coat of "driftwood" stain. Allow it to dry, then sand lightly or touch with fine steel wool. Then it is ready to finish with a coat or two of polyurethane.

After using this ladder, you'll wonder how you ever got along without it! PW

Mortise the underside of the top to accept the spine of the hinge.



photos by the author

Handy Ladder

Cutting List

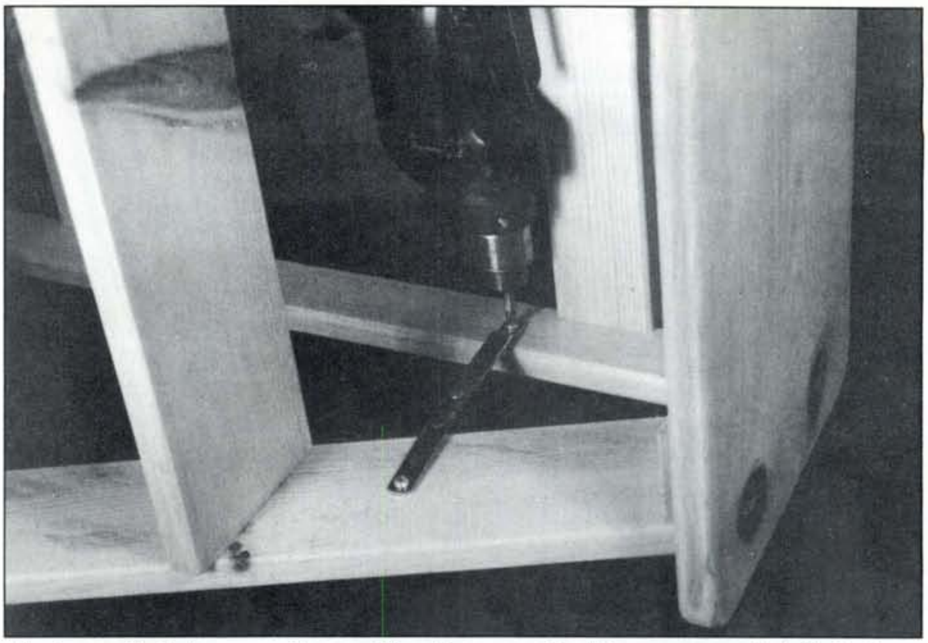
Qty	Part	Finished Size T	Finished Size W	Finished Size L	Piece
2	A	3/4"	3 1/4"	*30"	stringers
2	B	3/4"	4 1/4"	14"	steps
2	C	3/4"	2"	*25 1/2"	back legs
1	D	1/2"	4 1/2"	18"	jig base
1	E	1/2"	2"	18"	jig fence
1	F	3/4"	9 1/4"	16"	top
1	G	3/4"	2 3/8"	14"	upper crosspiece
1	H	3/4"	3 1/8"	14"	lower crosspiece
2	I	3/4"	2"	6 1/8"	glue blocks

Supplies

Qty	Item
1	card table leg brace
2	9/16" wide strap hinges
16	1 1/4" drywall screws

Card table leg brace #D1211 available from The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374. Antique brass 9/16" strap hinges #H2206 available from Craftsman Wood Service Co., 1735 W. Cortland Ct., Addison, IL 60101.

*rough length before cutting angles



Attach a card table leg support to one of the stringers and back legs so you can lock the ladder open. For this application, you'll have to remove the "butterfly" that usually attaches to the tabletop.

illustrations by Tom Larson

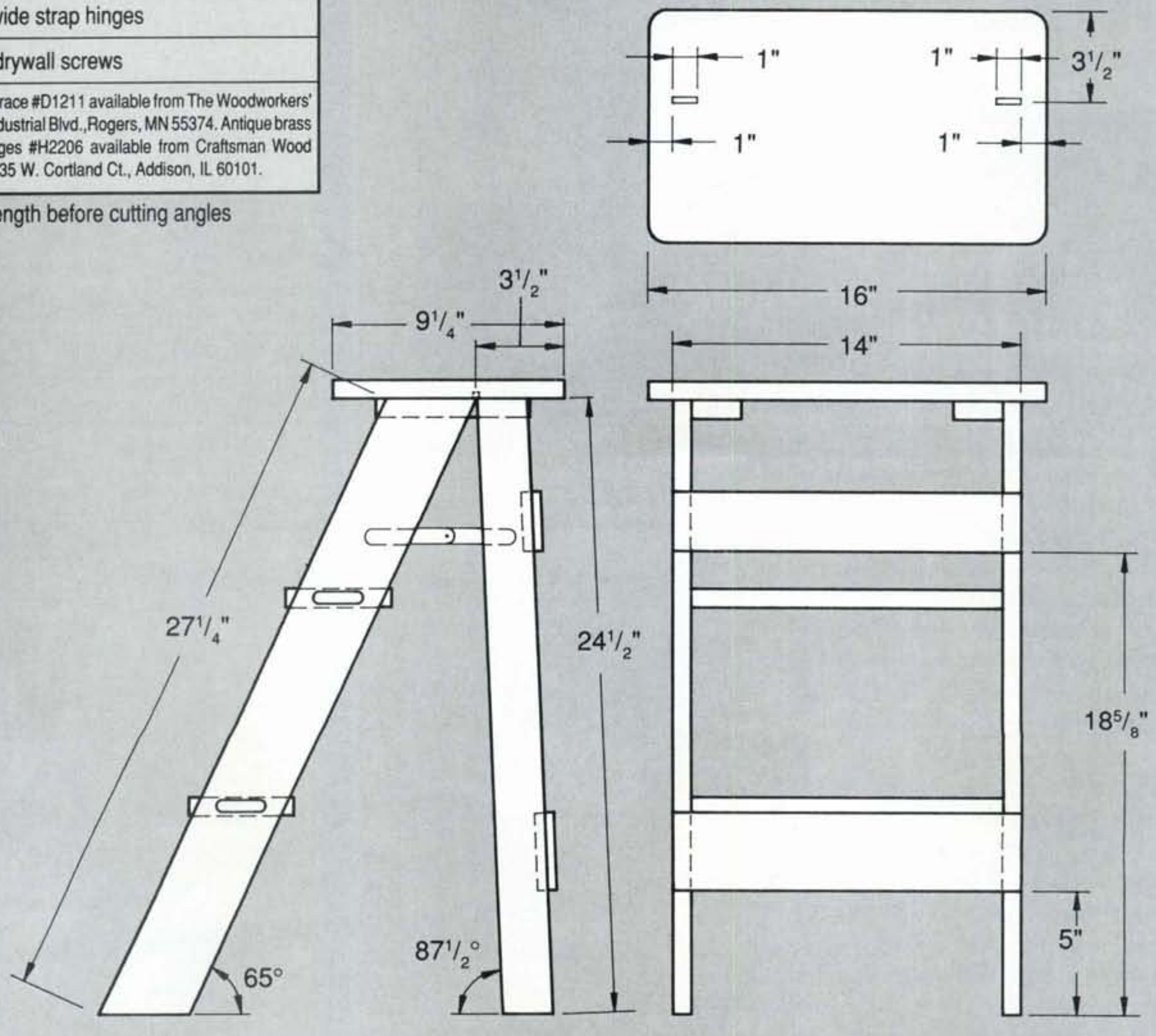
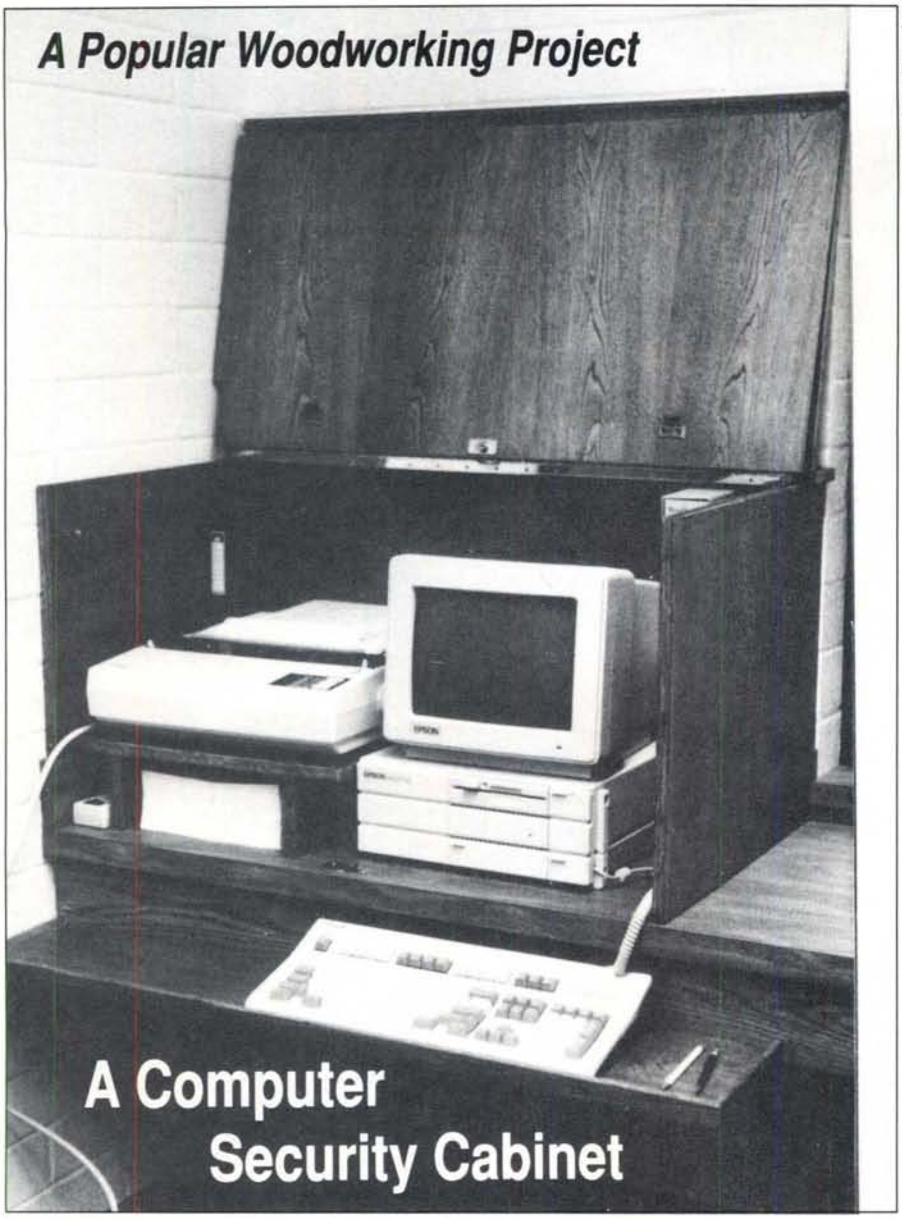


Figure 5. Orthographic Views

A Popular Woodworking Project



A Computer Security Cabinet

photos by the author

Computer Security Cabinet					
Cutting List					
		Finished Size			
Qty	**Part**	**T**	**W**	**L**	**Piece**
1	A	3/4"	8"	44"	keyboard shelf
1	B	3/4"	*23 1/2"	*20 1/4"	right side
1	C	3/4"	16"	36 3/4"	back
1	D	3/4"	16"	*23 1/4"	left side
1	E	3/4"	*38 3/4"	24"	top
1	F	3/4"	*38 3/4"	20"	front
1	G	1/4"	1 1/2"	38 3/4"	lip
2	H	3/4"	4 1/2"	*14 1/2"	printer table legs
1	I	3/4"	18"	*14 1/2"	printer tabletop
1	J	3/4"	7"	36 3/4"	inside shelf

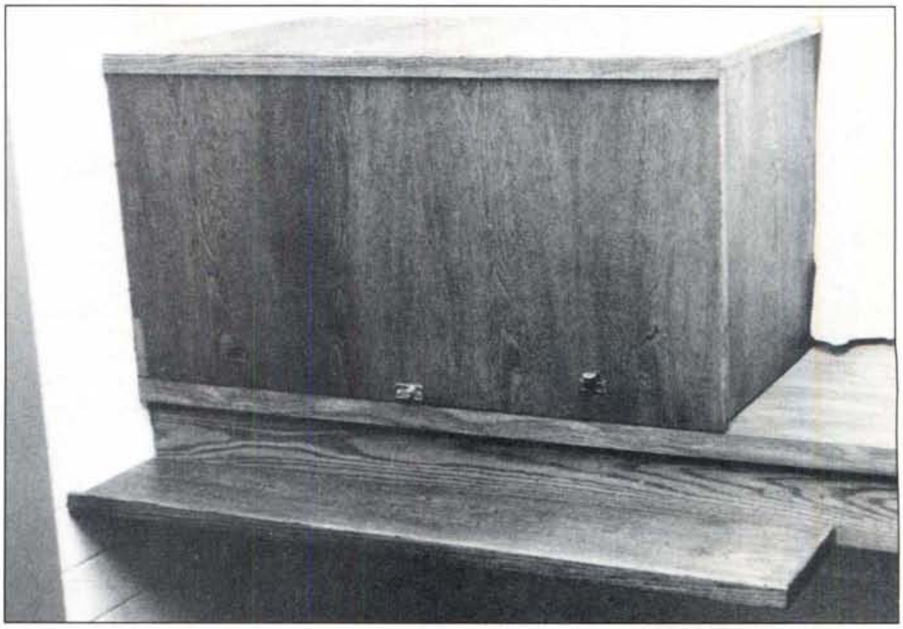
Supplies	
6	1/4" X 2" lag bolts with flat washers
6	1/4" lead anchors
9	#8 X 3/4" flat head wood screws
12	#12 X 3/4" flat head wood screws
3	6" right angle brackets
2	3/4" X 48" piano hinges
1	single–barrel sliding door lock
11	3/4" chair leg braces
2	door pulls

*includes 1/8" facing strip

by Evan Madsen

When our church purchased a computer system, part of the planning was to have a security cabinet built over it which would also function as a dust cover. The security feature was mainly to keep inquisitive youth from playing with it, and also for maintaining software file integrity.

The space allocated for the computer system was on an existing 24" wide countertop which did not allow enough room for the keyboard. After exploring several possibilities, I came up with the design shown here. The front and top of the cabinet are hinged on full–length piano hinges so that they can be folded up, out of the way when the computer is in use.



***Evan Madsen** is a hobbyist woodworker in La Mesa, CAlifornia.*

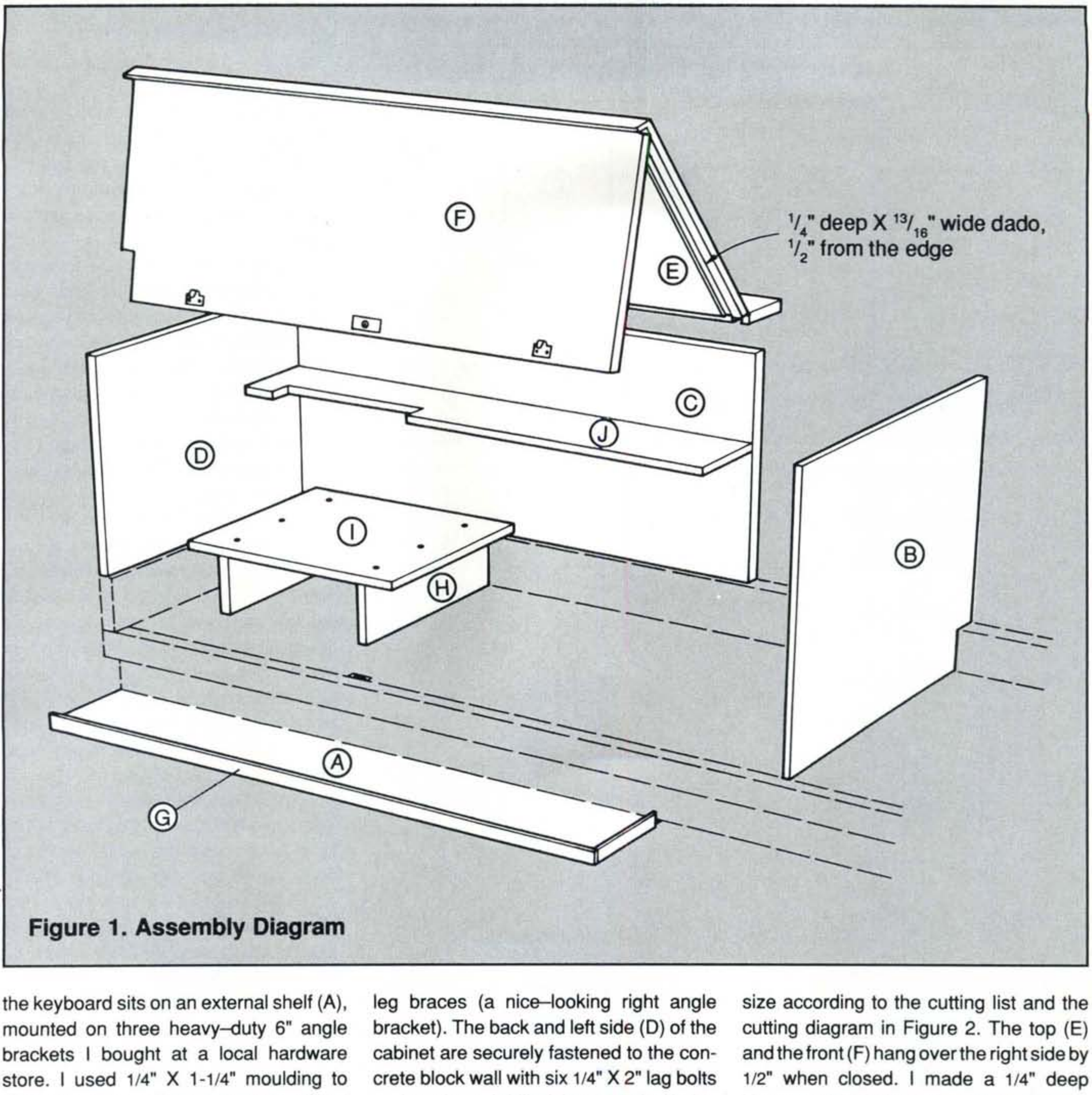


Figure 1. Assembly Diagram

illustrations by Tom Larson

the keyboard sits on an external shelf (A), mounted on three heavy–duty 6" angle brackets I bought at a local hardware store. I used 1/4" X 1-1/4" moulding to finish the edges of the ash plywood and also provide a nice 1/2" lip to hold the keyboard in place. The shelf is purposely about 6" longer than the cabinet. The added length makes handy room for pencils, floppy disks, or whatever. The position of the shelf puts the keyboard at the recommended standard height of 26-1/2" for optimum comfort for the average person. The keyboard is connected to the computer with a flexible cable and stored in the space alongside the computer, inside the cabinet when not in use.

The right side (B) of the cabinet is solidly fastened to the countertop and to the back (C) of the cabinet with 3/4" chair leg braces (a nice–looking right angle bracket). The back and left side (D) of the cabinet are securely fastened to the concrete block wall with six 1/4" X 2" lag bolts and washers. I drilled the mounting holes in the walls with a carbide–tipped masonry bit and used expanding lead anchors in the holes.

In order to match existing wood grain in the doors and cabinets in the room, I made the cabinet from one 4' X 8' sheet of 3/4" lumber core ash plywood. The existing countertop had an integral 4" backsplash along the back and side, so my cabinet was built to set on top of this backsplash. The cutting list and illustrations reflect this detail. I also had to notch the front and right sides of the cabinet to accommodate this backsplash (see Figure 1).

Cut the various pieces to approximate size according to the cutting list and the cutting diagram in Figure 2. The top (E) and the front (F) hang over the right side by 1/2" when closed. I made a 1/4" deep X 13/16" wide dado on the inside surfaces of these two pieces on the right side only, leaving the 1/2" overhang. This groove "captures" the right end, increasing the stability of the cabinet when closed. Cut this dado; then measure from it to determine the finished length of the back (C). I glued 1/8" strips of 3/4" oak to the edges of the plywood pieces where they would be otherwise visible in the finished cabinet. These strips matched well with the ash and gave a nice appearance. Attach the strips to the rough–sized panels; then trim the panels to finished size with the strips against the fence.

Next, using carpenter's wood glue and

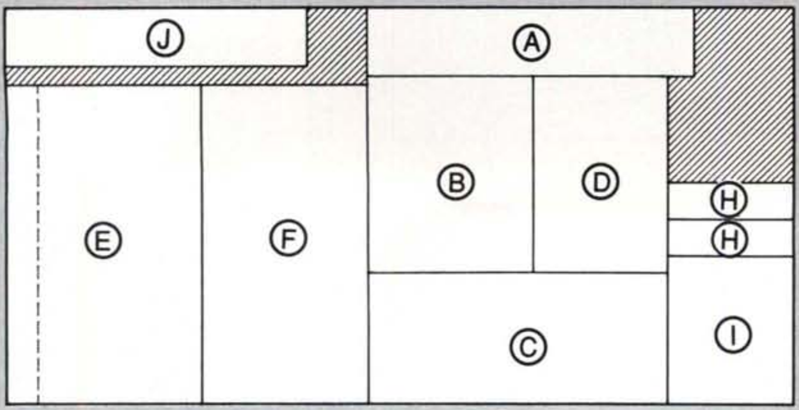


Figure 2. Plywood Cutting Diagram

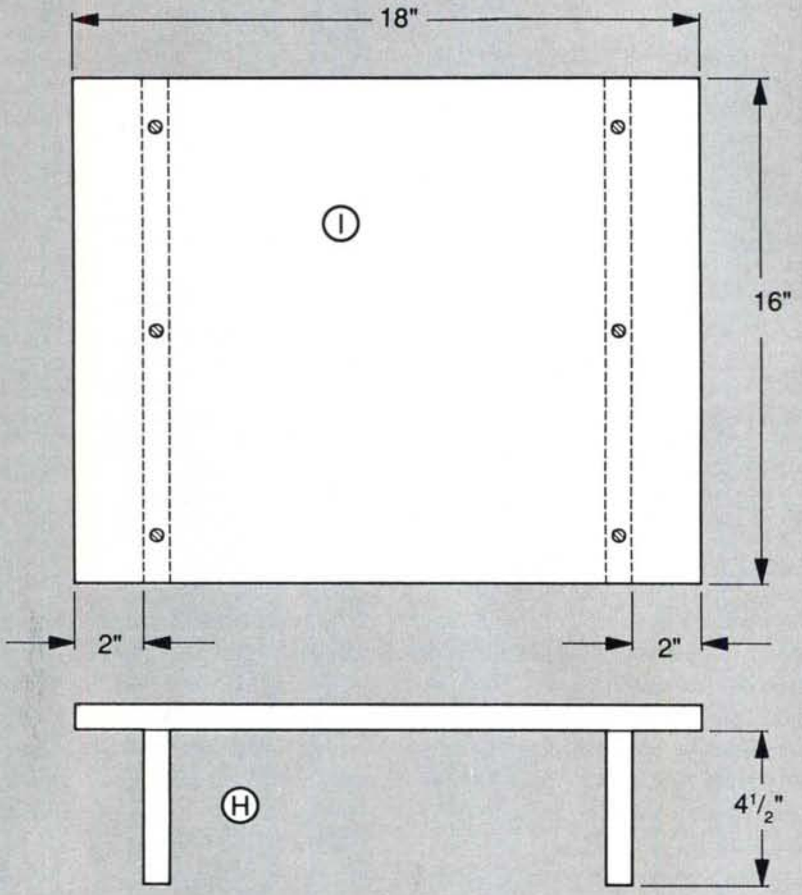


Figure 3. The Printer Table

Illustrations by Chris Larson

three #8 X 1-3/4" flat head wood screws in pre–drilled countersunk pilot holes, I assembled the left side (D) and back (C) pieces with a simple butt joint. I didn't want screw heads to show on the visible parts of the cabinet (and I didn't want to use plugs), so while this second butt joint (connecting the right side (B) and the back) was still in the bar clamps, I reinforced it with two chair leg braces on the inside corner.

The next step was to glue the lip (G) to the front edge of the top (E). This adequately covers the joint between these two pieces when the cabinet is closed and gives it a neat appearance. Next, I cut the 4" strip from the rear of the top piece and glued it in place to the back, left and right side pieces. I also used four chair leg braces (two on the back and one on each side) to further strengthen the butt joint. While the glue was setting up (about 30 minutes), I cut the piano hinges to proper length.

The next step in the cabinet assembly was to install the two piano hinges, being careful to line up the two top pieces and the front piece in sequence. I left a 1/8" gap on the left side so that the cabinet top and front would clear the wall easily as they are raised and lowered.

There was a sufficient amount of the ash plywood left over to make a simple but convenient table to set the printer on, with room for an ample stack of continuous–feed paper underneath. The legs (H) and top (I) of the table were assembled with a glued butt joint and three #8 X 1-3/4" flat head wood screws on each leg (see Figure 3). The space to the left of the table was designed to contain the multiple electrical outlet voltage protection box. This box was equipped with a switch which is used as the main system power on off control.

In order to match the existing woodwork in the room, I chose a Danish walnut stain followed by two coats of tung oil which gave it a pleasing satin finish.

The security lock is a single–cylinder sliding door lock which features a hardened hook that rotates under a plate that is flush–mounted directly on the countertop. The positioning of this lock plate was done after the cabinet was built and installed. I used my router to make the necessary clearance slot in the countertop for the hook of the lock.

After the cabinet was installed and the computer equipment was in place, I designed a removable shelf (J) to fit around the rear of the printer and the computer. It sits on top of four additional 1" chair leg braces which are screwed to the back and sides of the cabinet but not to the shelf itself. This allowed a convenient place for the paper output from the printer to fold up on and for storage of manuals and floppy disk files.

The final step was to install two pulls on either side of the centered lock on the front of the cabinet to enable easy opening and closing of the hinged panels. PW

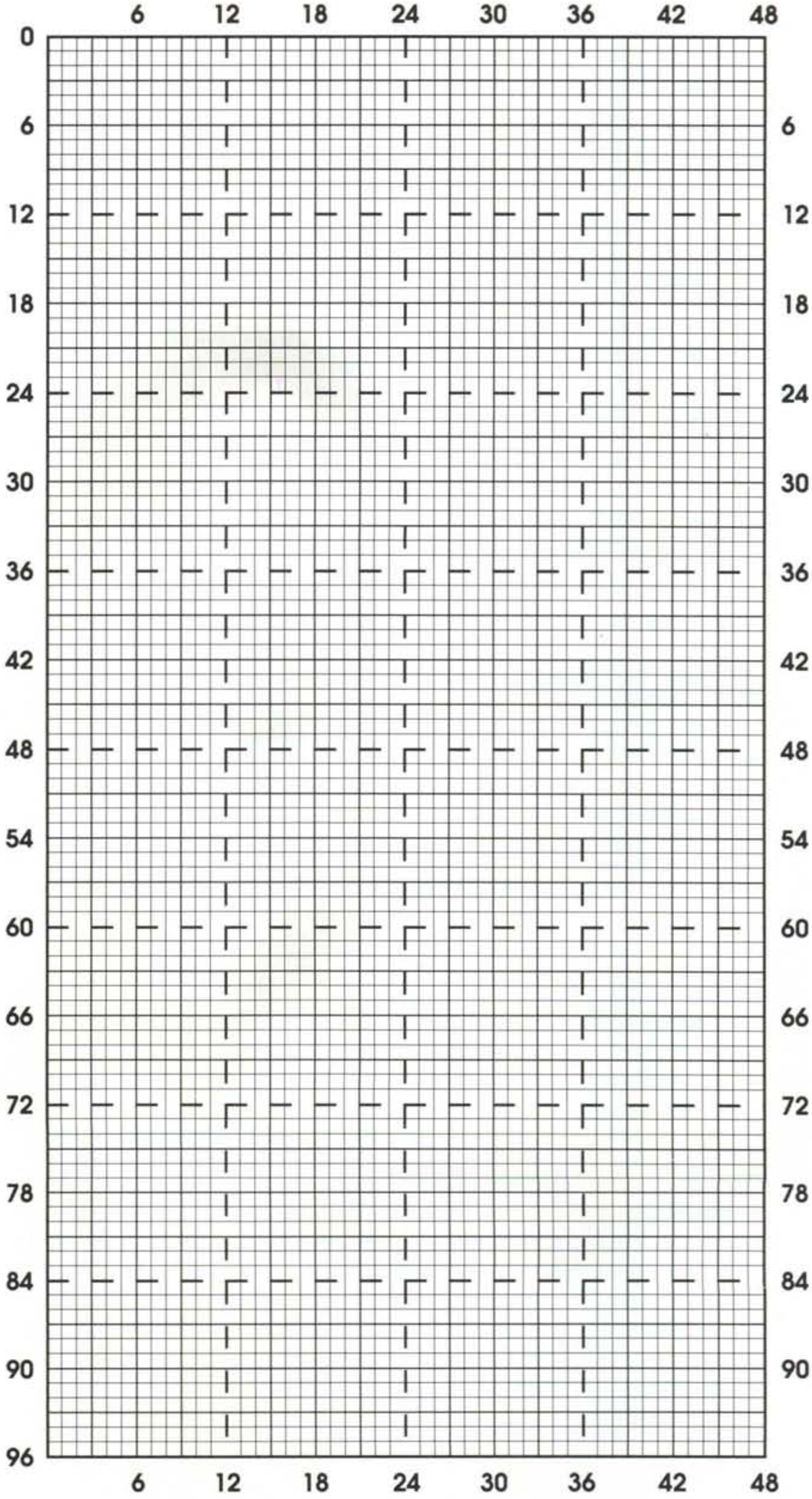
Panel Layout Form

by Don Kinnaman

When you want to make a project from plywood or other paneling, determining precisely how much to buy can be very difficult. This scale drawing layout form is just the ticket for figuring accurately the amount of material you need. It's also excellent for just "imagining on paper" new projects, or what might be done with large pieces of scrap paneling. Photocopy this page as many times as you like for your own personal use.

Outlining the project pieces on paper is especially important to keep waste to a minimum, or when the grain pattern is an essential part of the project's overall design and appearance. Outline the pieces of the project using the foot and inch division lines as guides. Don't forget to take the saw kerf into account when you're trying to squeeze in as many pieces as possible. Use the blanks below to record basic information, and save the layout forms with your project plans.

***Don Kinnaman** is a retired high school woodshop teacher from Phoenix, AZ.*



Project

Panel Material & Thickness

Notes

Sheet____ of____

Making Windsor Stools

by Walt Panek

I have always been fascinated by the assembly and construction techniques involved in making Windsor chairs. I enjoy the woodturning aspect of chairmaking more than the bending or carving, so I adapted some of the Windsor chairmaking techniques to what I call my "Windsor Stool." Like a Windsor chair, the undercarriage of my stool will actually get tighter with use. All parts will lock together without the use of glue, although I do use glue for final assembly.

The Seat

It is necessary to make the seat first so the other parts can be fitted to it. I have experimented with several styles of seat and found that the most popular and comfortable seat is high in the center and rounded on the edges. This design does not cut into the back of the leg and is easy for short people or children to get off and on.

I make my seat out of solid 2" stock—usually local hardwoods like oak, ash, or poplar which are commonly available in wide boards. This eliminates the step of edge gluing and follows the Windsor tradition of a one–piece seat. The seat blanks are selected for color because the seat is the most visible part.

The diameter of the seat will vary from 11" to 13", depending on the size of the stock. Cut rough stock to approximate diameter with a band saw. Mount the blank on a faceplate and rough–turn it round and flat. Lay out the three leg locations on the circumference of an 8" diameter circle using the indexing head on the lathe. When making sets of stools, I orient the leg sockets so the grain or color will be continuous when all the stools are lined up with the legs in the same relative position as shown in Figure 1.

Next I drill the holes in the seat blank, which is clamped to my drill press table, at an angle of about 15°.

I bore holes with a custom made tapered drill bit (see "Chairmaker's Dreamer" below). This bit cuts slow but leaves a perfectly polished and tapered hole. The drill press is necessary because all the holes should be exactly the same depth for the top of the seat to look right where the legs come

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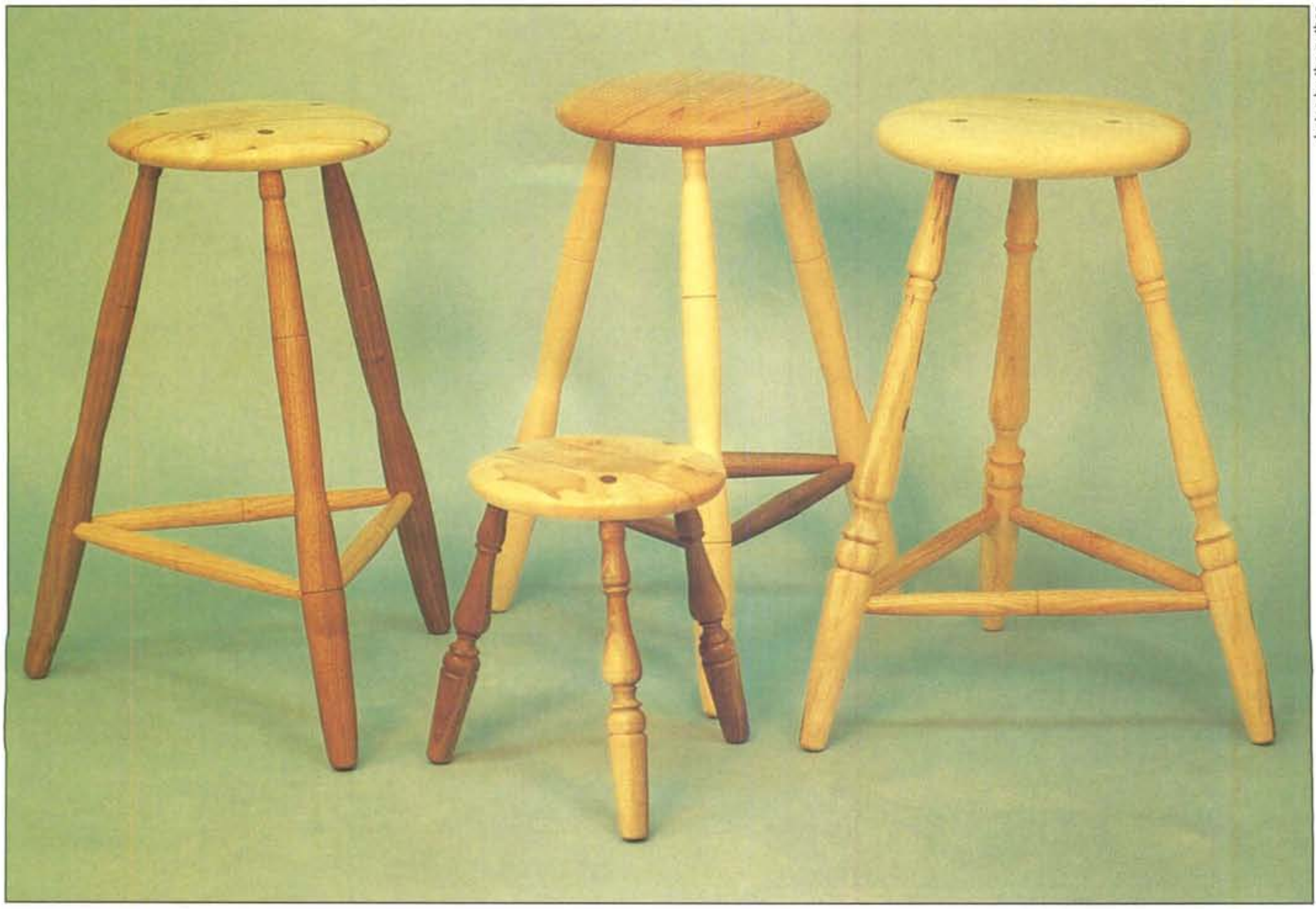
***Walt Panek** works wood in Kingsport, Tennesee.*



photos by the author

through. Also, if the bit is not fed perfectly straight and slowly, it will grab and ruin the hole.

My original bit for drilling this tapered hole was a spade bit ground to the right shape. It did work, but it was not stout enough to scrape the deep hole and drilling was extremely slow. After drilling, turn the seat on the outboard spindle of your lathe and sand through 220 grit.

The Legs

A three–legged stool will always sit flat on the floor and is more difficult for kids to rock, which is bound to extend its life. Additionally, the three stretchers form a triangle which will help hold the structure together. It is impossible to pull out one stretcher without bending the adjacent tenon or leg. The finished height of the stool is 24"—suitable for a standard 36" high countertop.

In keeping with the Windsor tradition, my leg is a variation of the bamboo style

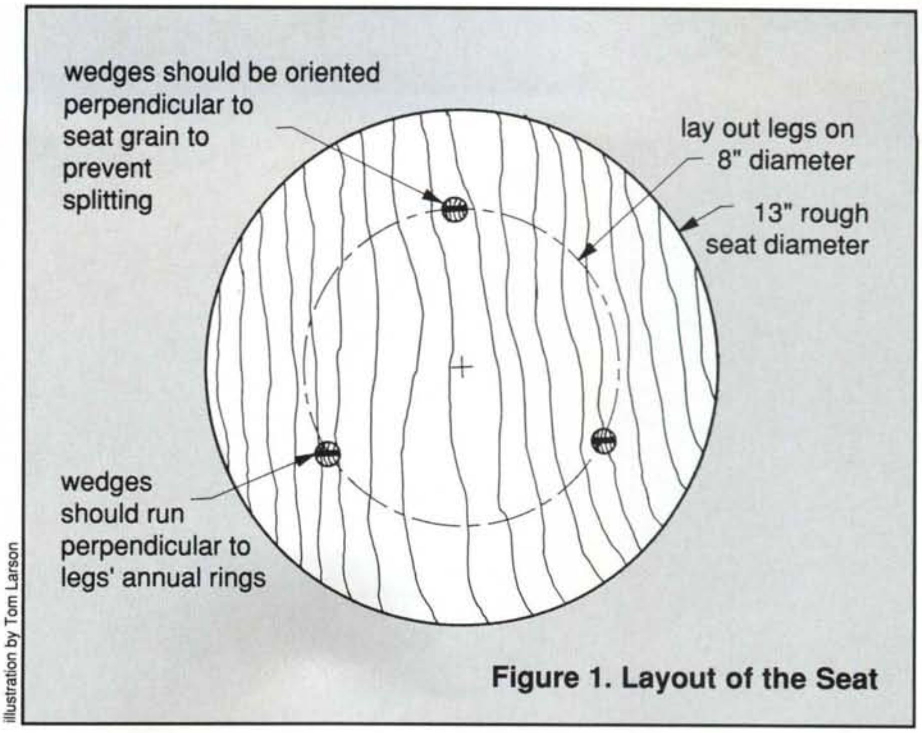
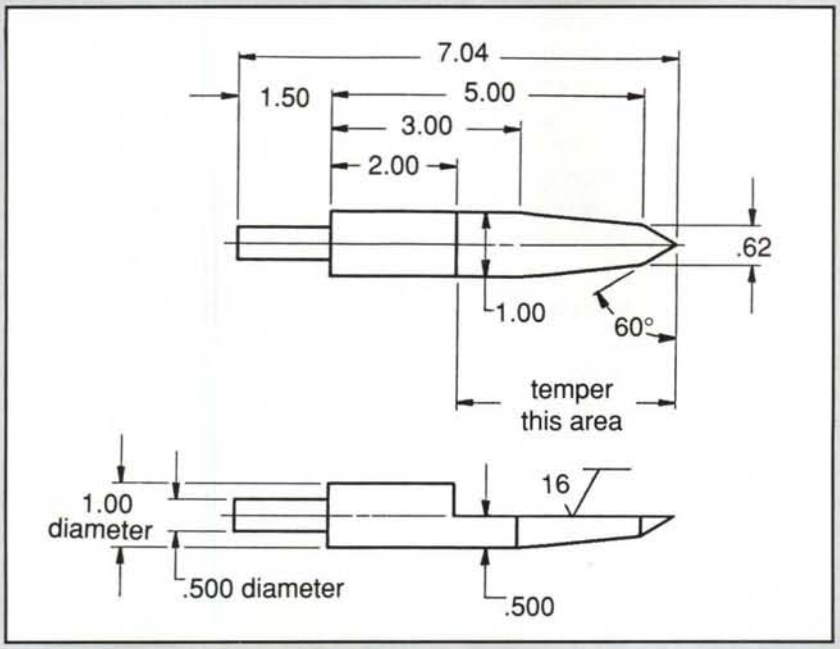

wedges should be oriented perpendicular to seat grain to prevent splitting
lay out legs on 8" diameter
13" rough seat diameter
wedges should run perpendicular to legs' annual rings

illustration by Tom Larson

Figure 1. Layout of the Seat

Chairmaker's Dreamer

author



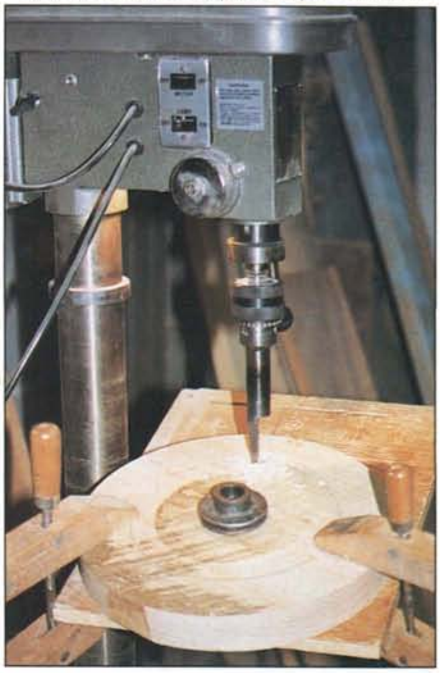
I made the chair reamer of my dreams by turning a piece of 1' drill rod on a metal lathe. First anneal the steel by heating to a dull cherry red and allowing it to cool very slowly. Turn it to the profile shown in the top view above. Now mill away the portion shown in the side view, leaving .005" for final grinding. Grind the flat surface smooth to .5" thick and lightly hone away the tool marks.

Harden the tool by heaating it to bright red and quenching it in a light oil (SAE 20). Now temper it by heating the business end to a straw color and immediately quenching it in oil to room temperature.

Hone the flat cutting surface and polish the outside diameter. Then grind the clearance angle on the end.

Rough–turn the seat on the outboard side of the lathe.

Clamp the seat blank to the drill press with the table tilted to 15°, and drill the holes with a special tapered reamer.



Lay out the major diameters along the length of the leg stock using the pattern shown in Figure 2, and check the turned diameters with the sizing tool shown in Figure 3.

which was popular on later Windsor chairs. I usually make the legs of maple for strength and rigidity.

You'll find a full–size pattern for the leg (including the tapered tenon) in the PullOut™ Plans section in the center of the magazine. Use it to make a notched layout stick to precisely locate all of the major diameters for parting tool cuts (see Figure 2). Other construction details are also noted on the stick.

I also use a custom made sizing tool shown in Figure 3 to check the diameters. This tool is made from thin aluminum which can be easily cut with a band saw and filed to size. The dimensions of the tool do not have to be exact as long as they are close. These diameters are then connected by eye and finish sanded. Turn the tapered tenon a little oversize; then return it to the lathe after a trial fit in a tapered hole.

When the tenons all fit, cut a notch for a wedge with a band saw. Be careful to cut across the annular rings so the leg won't split when a wedge is driven in (see Figure 1). The seat and three legs are then rough–assembled with each leg marked for a corresponding seat hole. Orient the notches in the tenons so they are perpendicular to the grain of the seat; this prevents the seat from splitting when the wedges are driven in.

Stretchers

I make my stretchers out of rough 1" walnut or cherry. The blanks must be selected for straight grain, because people frequently stand on stool stretchers. It is important that each stretcher be measured and fitted individually. Small errors in drilling angles in the seat are multiplied over the distance to the stretchers. There is usually about 1/2" difference in the required length for each stretcher.

Drill holes for one stretcher with an electric hand drill. Measure the distance between the top of these holes, and add 1-1/8" to this distance to determine the finished length of the stretcher (that is 1/2" for each tenon and 1/8" to "stretch" the legs apart).

Cut the stretcher blank to length before turning. I use a mini drive center which allows me to completely turn both tenons without remounting the blank. I don't use a pattern since most stretchers are different lengths. After turning the blank to a uniform 1" diameter, I locate the center and mark 1/2" on each end for tenons.

Cut a taper from the center to a small

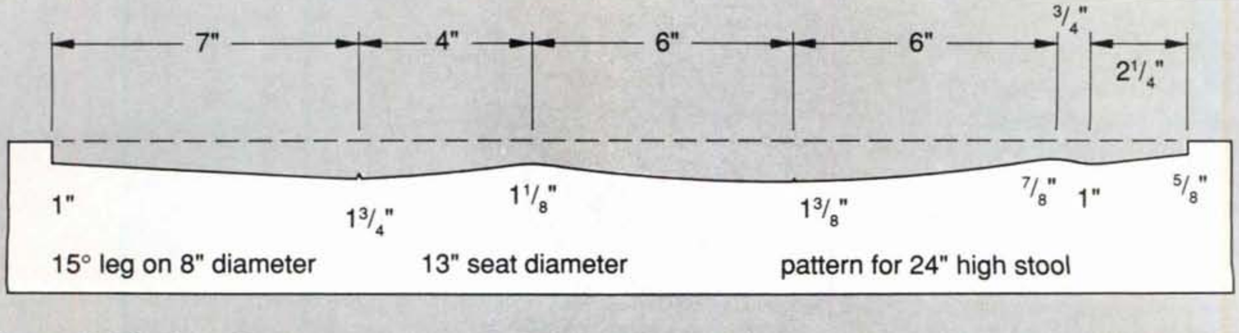


Figure 2. The Leg Pattern

See the PullOut™ Plans section for a full–size pattern.

Illustrations by Tom Larson

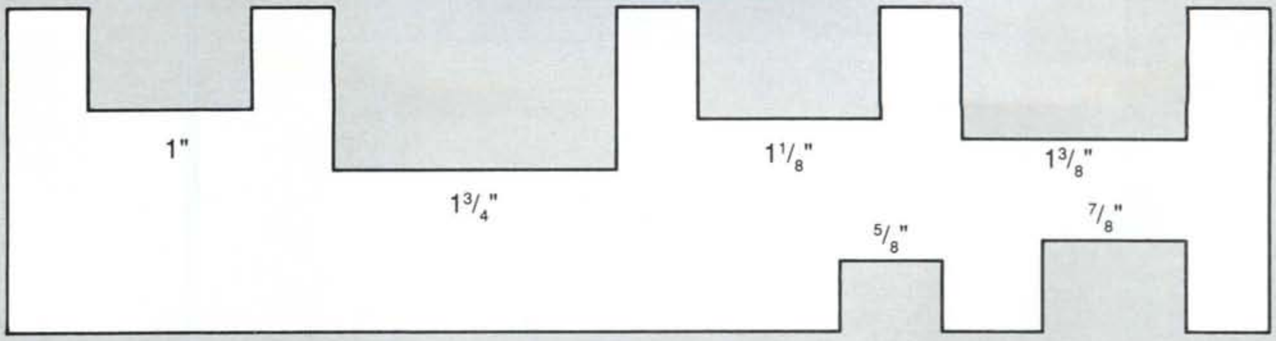


Figure 3. Diameter Sizing Tool

shoulder at each tenon and cut a "V" in the center to match those in the legs.

Fit this stretcher in place before drilling the two holes for the next stretcher.

Assembly

Assembly of your Windsor Stool is the most rewarding part. Dry–assemble the stool to check the fit. Place the stretchers in their corresponding holes and then fit the tapered tenons in the seat. As you drive each leg home with a wooden mallet, you'll hear a satisfying "clunk" as the matched tapers on the legs and seat "mate." At this point, the stool should be completely rigid so the only way to take it apart is to drive the ends of the tenons (which extend through the seat) back out with a wooden mallet.

If I am satisfied with the fit and stability of the stool, I disassemble then reassemble with white glue on all of the tenons and inside the notch in the tapered tenon. Yellow glue does not give enough working time to assemble the stool.

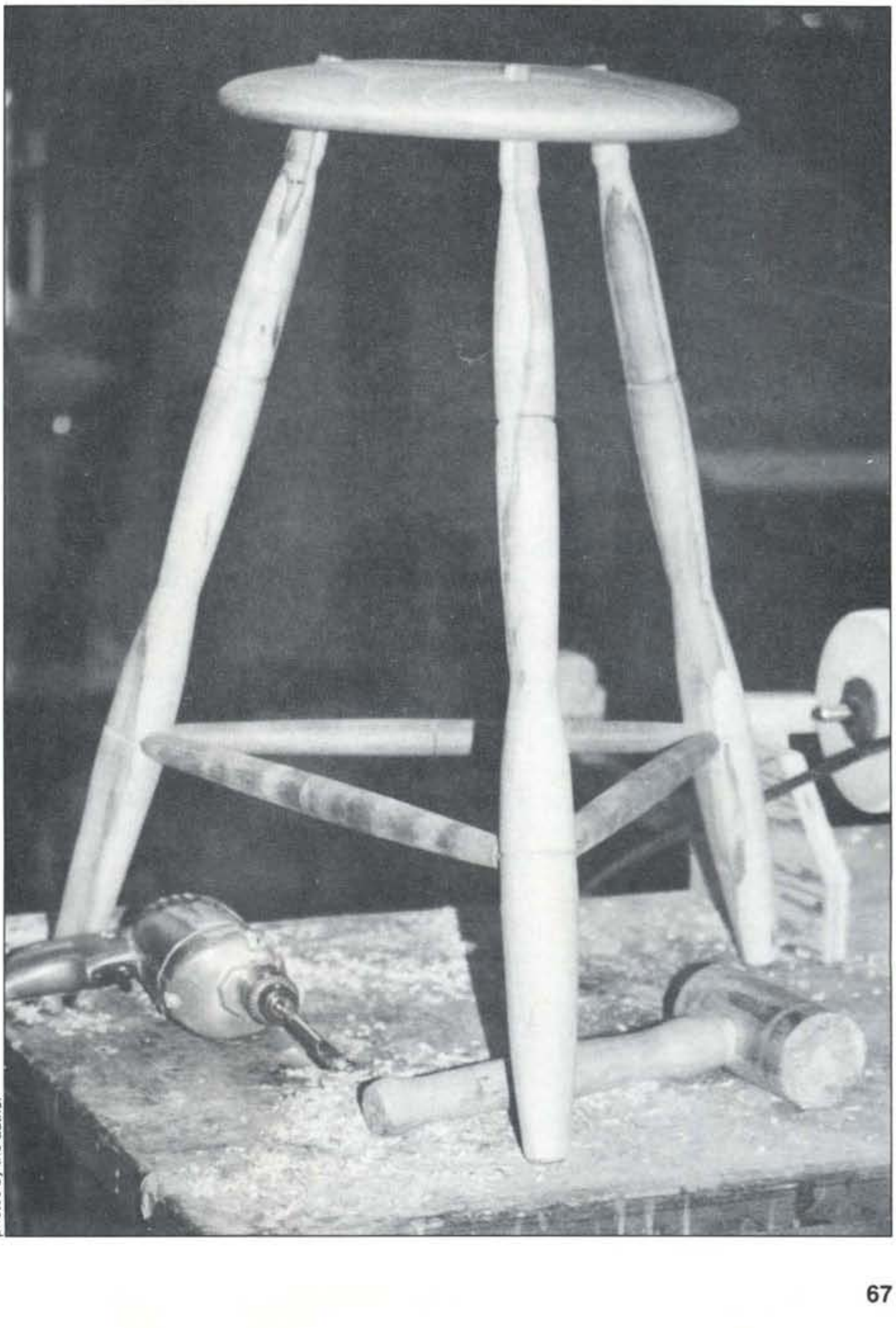
I drive in contrasting wood wedges (usually walnut) in the top of each leg until I hear the characteristic "thunk" indicating the wedge is home.

When the glue is dry, I sand the protruding leg tenons flush with a 3" disk in an electric drill and finish with a foam–backed 5" disk.

Finish

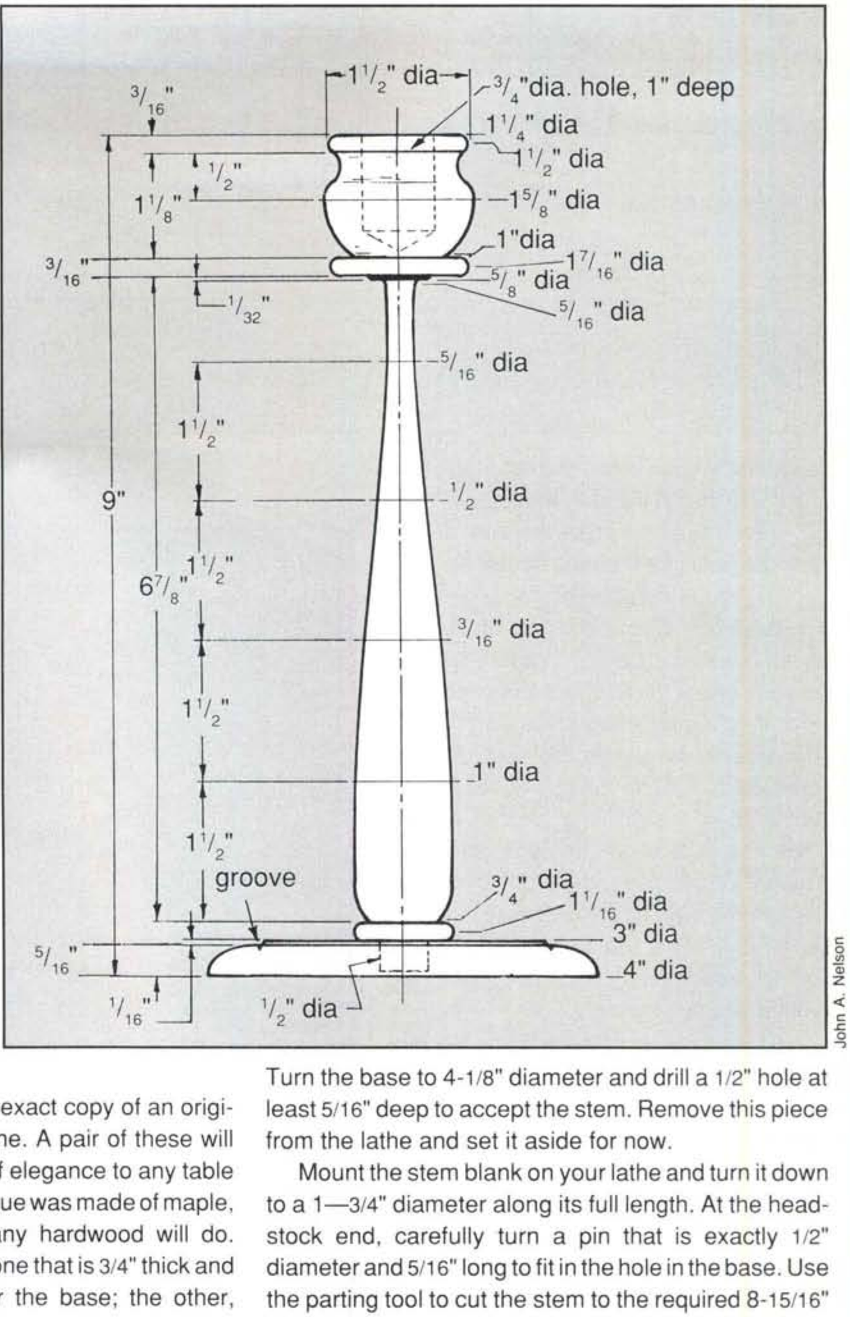
For a finish, I seal with sanding sealer, sand with 220 grit no–fill paper or steel wool, and apply several coats of tung oil varnish. This finish gives a natural appearance to the contrasting woods. On the top of the seat, I apply a mixture of carnauba and beeswax with a buffing wheel which gives a nice patina and feel to the natural colored woods. **PW**

Once the wedges are glued in, it's impossible to pull the stool apart. Belt sand the wedges and the ends of the legs flush to the seat.

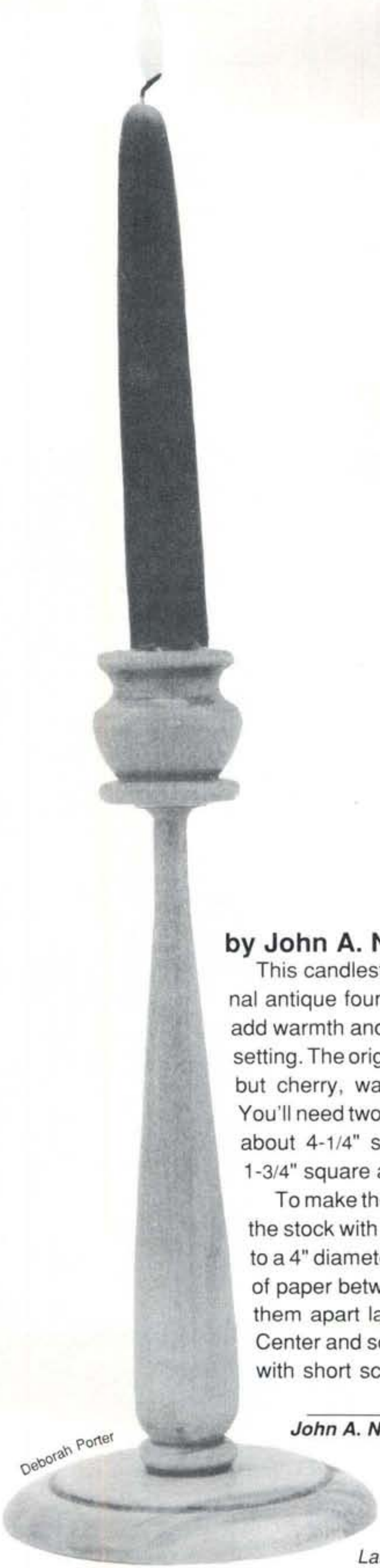


photos by the author

Early American Candlestick



John A. Nelson



Deborah Porter

by John A. Nelson

This candlestick is an exact copy of an original antique found in Maine. A pair of these will add warmth and a look of elegance to any table setting. The original antique was made of maple, but cherry, walnut or any hardwood will do. You'll need two pieces; one that is 3/4" thick and about 4-1/4" square for the base; the other, 1-3/4" square and about 10" long.

To make the base, scribe a 4-1/4" circle onto the stock with a compass and cut it out. Glue it to a 4" diameter piece of softwood with a piece of paper between them so you can easily pry them apart later. Let the glue dry overnight. Center and screw a faceplate to the softwood with short screws and attach it to the lathe. Turn the base to 4-1/8" diameter and drill a 1/2" hole at least 5/16" deep to accept the stem. Remove this piece from the lathe and set it aside for now.

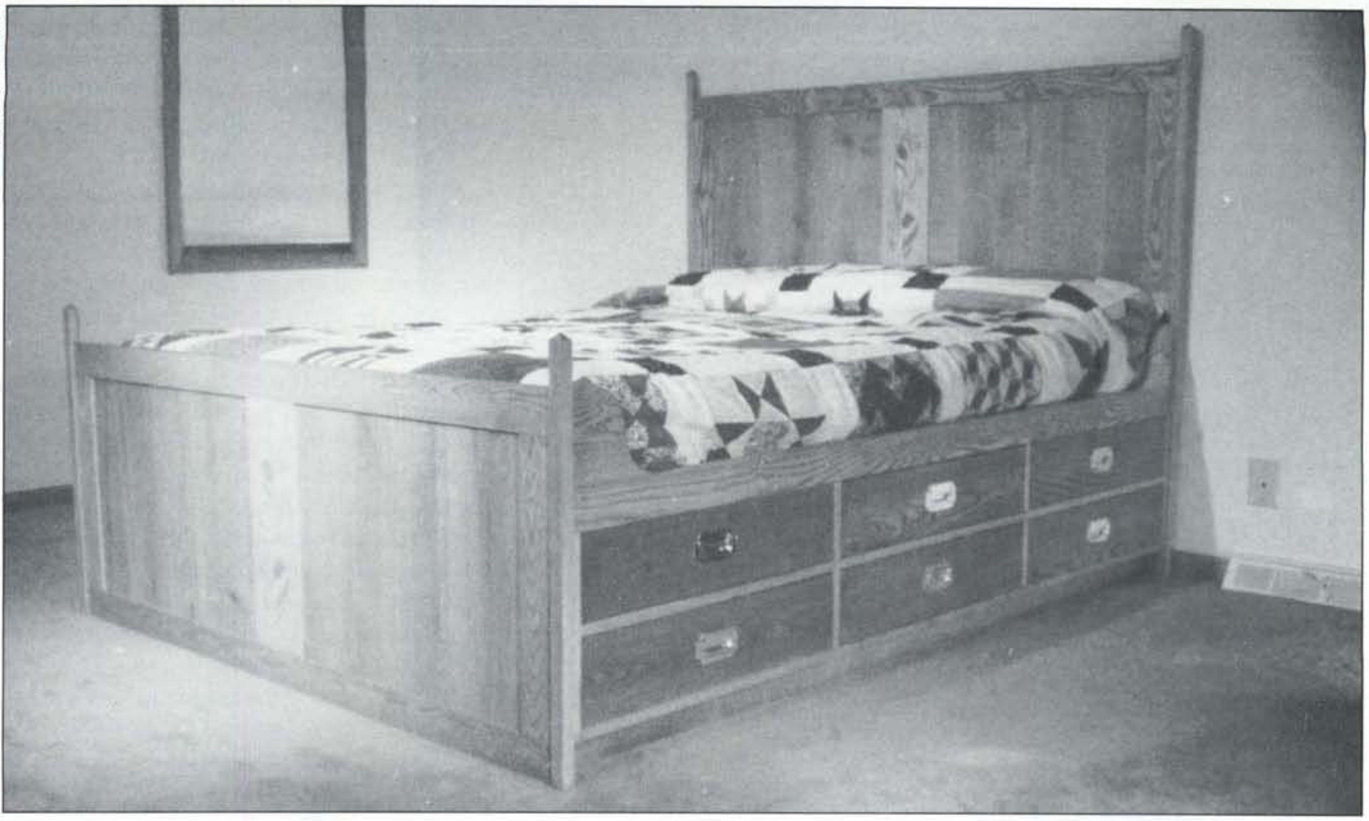
Mount the stem blank on your lathe and turn it down to a 1—3/4" diameter along its full length. At the headstock end, carefully turn a pin that is exactly 1/2" diameter and 5/16" long to fit in the hole in the base. Use the parting tool to cut the stem to the required 8-15/16" length and remove the stem from the lathe.

Now re–attach the base and faceplate to the lathe. check to see that you have a very snug fit between the base and stem. Spread glue on the pin of the stem, fit it in the base, and, using the tailstock as a clamp, allow it to dry for 24 hours. Make sure that the tailstock is exactly centered on the stem before tightening and allowing the glue to set.

When the glue is dry, remove the tailstock and turn a 3/4" hole that tapers slightly in the end of the stem. Insert a 3/4" dowel that is about 1-1/8" long into the hole and center it on the tailstock. This will make the candlestick one solid unit between centers. Finish turning it as shown in the illustration, sand it with 400–grit paper and apply the finish of your choice. **PW**

***John A. Nelson** is a woodworker and drafting instructor from Peterborough, New Hampshire, and the author of 26 books on various subjects, including* How to Build a Grandfather Clock *(TAB Books, Monterey Lane, Blue Ridge Summit, PA 17214).*

photo by the author



Captain's Bed

by James H. Schroeter

When it was time to move into our new addition, we decided to replace the bed and add more storage space. I wanted the storage capacity of a dresser located in the unused floor area beneath the bed. But most platform beds seem just massive stacked planks with drawers added as an afterthought. I wanted the look and feel of quality furniture, so I decided to design my own.

My plan is based on a captain's bed built into the side of a ship. The quartersawn oak head and footboards give a built–in impression, and the flush drawers and inlet handles enhance the sense of permanence and quality, while providing 24 cubic feet of storage space. With its knock–down fittings, the bed readily disassembles into flat, transportable sections, yet when reassembled it maintains its rigid structure.

Getting Started

I used kiln–dried ash, maple, and quartersawn oak, as well as plywood, to build the bed. Although the cutting list and the instructions here reflect my wood choices, feel free to use whatever strong and durable wood you like. I chose ash for most of the visible parts because it matches other furniture in the room. It doesn't have a particularly lively grain, however, so I selected the quartersawn oak, with its bolder figure, for the head and footboard panels. They're glued up from pieces resawn and book–matched. I resawed the maple for the drawer boxes, too, but you can use any 1/2" material, including plywood.

James H. Schroeter *is a chemist and project administrator in Milwaukee who enjoys woodworking as a hobby.*

Acclimate all your stock to room conditions before cutting, and saw pieces to their final length only after planing to proper thickness and width. Allow any resawn stock to acclimate again after resawing. Surface all faces and edges so they are flat and perpendicular, and saw all boards and plywood pieces to their final width and thickness as specified in the cutting list. Note that the dimensions of the false drawer fronts (K) are slightly oversize since final trimming should take place only after the drawer openings have been framed.

Curved Side Pieces and Bedposts

The curved side pieces (A) are cut from two pieces of ash, but be sure to leave the 1/4" tail piece on each curved section as shown in the full–size PullOut™ Plans in the center of the magazine. When the curved sections are glued to the sides, the tailpiece and the flat portion provide clamping space.

Cut the pointed tops of the headboard posts (B) and footboard posts (C) with a miter box. Mark the posts on all four sides and, as you cut and turn, line up each mark with a reference point on your miter box to insure that all angle cuts will start at the same level. Then trim the posts to their final length.

Head and Footboard Stiles and Rails

Cut a 1/4" wide, 1/2" deep groove centered along the inside edges of all the head and footboard rails and stiles (D, E, F and G). The head and footboard muntins (G) and the wide headboard rail (E) have this groove cut in *both* edges. While you're at it, cut the same groove on the inside edge of each side stile (H). Set the side stiles aside for now.

Now, as shown in Figure 1, cut 1/4" thick, 1/2" long tenons on

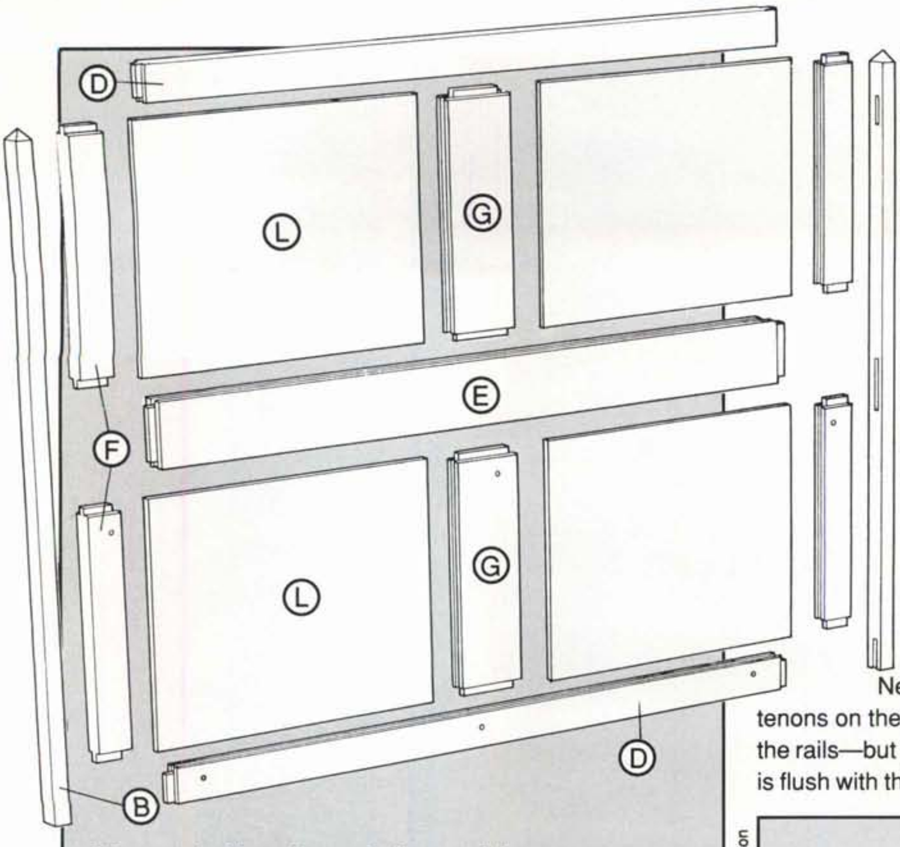


Figure 1. Headboard Assembly

illustrations by Tom Larson

the ends of stiles (F), muntins (G), rails (D) and (E), and, while you're at it, down the side edges of the plywood cross partitions (O). Set the partitions aside.

Check for fit by laying out all the pieces for the head and footboard frames and assembling them. Mark the mortises on the posts (B and C) as shown in Figure 2 to accept the tenons on the rails. Mark them such that when the head and footboards are assembled the posts will be flush with the frames on the inside surface (toward the mattress) and 1/4" proud on the outside surface. When the fit is satisfactory, disassemble the pieces and store them while you make the oak panels (L).

Head and Footboard Panels

Start panel construction by flattening one face of each board on the jointer and then squaring up one edge. Rip the opposite edge parallel to the first, joint it smooth, and plane all the panel pieces to the same thickness—3/8" or slightly greater. Bookmatch and arrange them to give a pleasing grain pattern. Check that all edges join smoothly with no gaps and apply glue. Clamp lightly, being careful not to bow the thin panels. You may want to place wax paper on the top and bottom of the panels, and clamp them between cauls to keep them flat while you tighten the edge clamps. When the panels are dry, scrape off any excess glue, and cut them to final size.

Bevel the edges of the panels to achieve an edge thickness of 3/16". To do this, tilt the table saw blade to 5° out of square (*away* from the fence), set the fence at 3/16" from where the blade disappears into the table, and run the panels through vertically. [*Editor's note: for more information about this procedure, see "Panel Door Construction" in* Popular Woodworking *#45, October 1988.*] Run the panels through with their best faces flat against the fence. Bevel the top and bottom edges (across the grain) first, and then the sides. Sand both faces of the panels smooth. If you plan to stain the bed, coat both sides of the panels with a penetrating sanding sealer and stain them now, so that no unstained wood will show should the panels move in their frames due to changes in humidity.

Head and Footboard Assembly

Before any gluing, dry–fit the pieces and panels as shown in Figure 1, and check for squareness. Earlier, when you laid out the posts and marked the positions of the mortises, the posts stood out from the panel frame 1/4". If you have the pieces flat on the workbench, insert the footboard panels with their best faces up. Insert the headboard panels with their best faces down, however, since the *inside* of the headboard will be the visible side. Mark on rails (D) and (E) the position of the muntins (G), and disassemble the frames. Apply glue to the tenons on each end of the muntins and clamp them in position.

Next, slide the panels in face up. Apply glue to the tenons on the end stiles (F) and insert them into the grooves in the rails—but push them in only until the outer edge of each stile is flush with the shoulders of the rails. Make sure the panels are

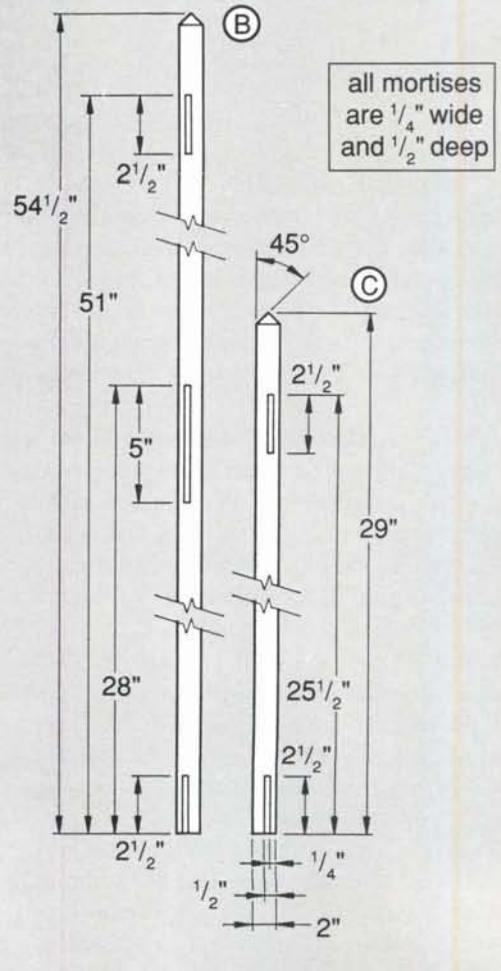


Figure 2. Head & Footboard Post Mortises

Captain's Bed Cutting List

Qty	Part	Finished Size T	Finished Size W	Finished Size L	Piece
ash					
4	A	3/4"	6"	7"	curved pieces
2	B	1"	1"	54 1/2"	headboard posts
2	C	1"	1"	29"	footboard posts
4	D	3/4"	3"	63"	head & foot–board rails
1	E	3/4"	6"	63"	wide head–board rail
6	F	3/4"	3"	20 1/2"	head & foot board end stiles
3	G	3/4"	6"	20 1/2"	head & foot board muntins
8	H	3/4"	5"	18"	side stiles
10	I	3/4"	3"	82 1/2"	side rails
18	J	3/4"	1"	24"	platform supports
12	K	3/4"	*6"	*26 3/4"	false drawer fronts

*rough size—trim to exact size after fitting

Qty	Part	Finished Size T	Finished Size W	Finished Size L	Piece
oak					
6	L	3/8"	25 7/8"	20 3/8"	head & foot–board panels
maple					
24	M	1/2"	5 1/4"	30 1/2"	drawer sides
24	N	1/2"	5 1/4"	25 1/2"	drawer ends
plywood					
4	O	3/4"	18"	54 1/2"	cross partitions
1	P	3/4"	18"	81 3/4"	lengthwise partition
12	Q	1/4"	25"	30 1/8"	drawer bottoms
2	R	1/2"	31"	82 1/2"	platform panels

Supplies

Qty	Item
12	5" X 5/8" mending plates (4–hole)
12	2" X 1/2" mending plates (2–hole)
16	corner angle brackets
12	1/4" X 20 threaded inserts
20	1/4" X 20 tee–nuts
44	1/4" X 1 1/4" machine screws
24	1/4" X 1" machine screws
20	1/4" X 3/4" machine screws
28	1/4" nuts
44	fender washers
48	1" flat head wood screws
28	5/8" flat head wood screws
12	recessed drawer pulls
12 pr	drawer slides

At the Lumber Yard

Assuming you use the woods I chose, you'll need 58 board feet (includes 10% waste) of 4/4 ash for parts A, D, E, F, G, H, I, J and K (a few feet less if you make hidden parts J from scrap two–by). For B and C you'll need 2 bf of 5/4 or, if 5/4 is unavailable, 5 bf of 8/4—the *finished* thickness of B and C must be a full inch. M and N require 41 bf of 3/4 maple (since they're drawer pieces that don't show, you could use a cheaper wood.)

Parts P and O require 3 panels of 3/4" plywood (or 2 if you use 4 X 10 sheets), R needs 2 panels of 1/2", and 4 panels of 1/4" are needed for parts Q. If you don't have any scrap lying around to use, you soon will!

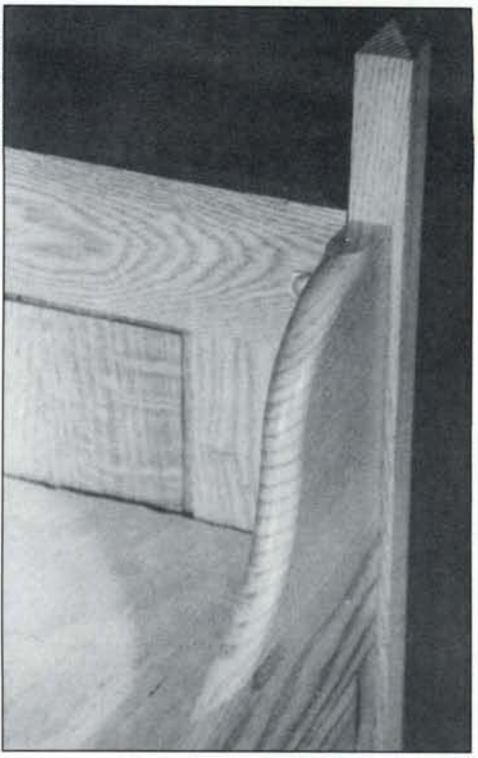


photo by the author

When you rout the second side of the curved piece, you may need to place masking tape on the first side to support the bearing pilot of the round over bit. This helps prevent a ridge down the edge's center that must be sanded off. The corner brace (partially visible) is fine, but the dowels described in the text are just as strong—and won't show.

seated in the grooves and no glue has reached them—they must be free to move in their frames. Check for squareness and clamp until the glue dries.

Lastly, apply glue to the tenons on the rails and to the (outer) edges of the stiles, and clamp the head and footboard posts in position until the glue sets. Remove the clamps and scrape any excess glue from around the joints. Sand, apply sanding sealer, and stain the entire frame as you did the panels. After staining, I finished my head and footboards with two coats of oil.

Sides and Partitions

To assemble the sides, first shape the tenons and the top and toe recesses in side stiles (H) as shown in the PullOut™ Plans. Note that of the eight side stiles, four are located at the ends of the side rails (I), while the other four are spaced at 26-1/2" intervals along them (see Figures 3, 4 and 5). The two types require different detail cuts: the center side stiles (H-a) need a slot for a cross lap joint, while the end side stiles (H-b) take mortises instead. The PullOut™ *Plans include full–size* patterns for each, and Figure 4 shows those portions of the side rails that form joints with the stiles. Four of the side rails, the top face (I-a) and toe (I-e) pieces, receive no tenons or mortises. I chose the joining method shown in the patterns because the tenons weren't difficult to cut with my router and a tenoning template, but feel free to use any durable joint, such as blind or through dowels. Your goal is a rigid, permanently square frame.

Source List

The 1/4" X 20 threaded inserts and T–nuts are available from The Woodworker's Store, 21801 Industrial Blvd., Rogers, MN 55374-9514, tel. 1-612-428-2899, and from Albert Constantine & Son, 2050 Eastchester Road, Bronx, NY 10461, tel. 1-212-792-1600. Solid brass inserts are available from Woodworker's Supply of New Mexico, 5604 Alameda Place, NE, Albuquerque, NM 87113, tel. 1-505 821-0500, and from Woodcraft, 210 Wood County Industrial Park, Box 1686, Parkersburg, WV 26102-1686, tel. 1-800-225-1153. Blum drawer slides are available from Woodcraft and The Woodworker's Store. Recessed campaign–type drawer puls are from The Woodworker's Store (catalog #D7420).

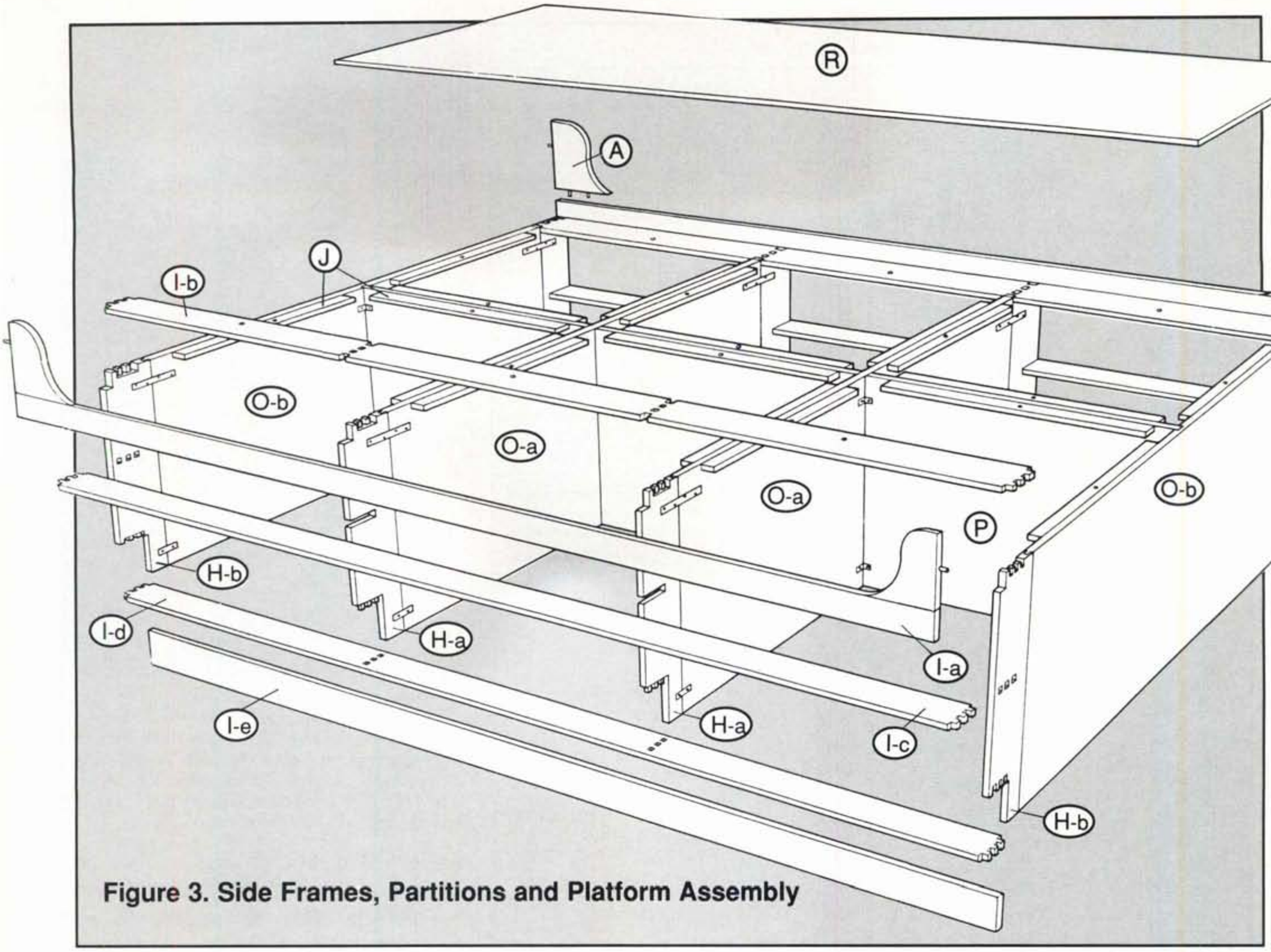


Figure 3. Side Frames, Partitions and Platform Assembly

Dry–fit the side frames and check for squareness. Glue the stiles and the horizontally positioned rails together, holding the top face and toe rails aside for the moment. Continue checking for squareness as you adjust the clamps.

Now drill a pair of holes for dowels in the bottom edge of each curved piece (A) and corresponding holes in the upper edges of the top face side rails (Figure 5). Also drill for a dowel in the edge of the curved piece that will face the head/footboard post, but don't install this dowel until later. Peg and glue the curved pieces to their rails, clamping on the flat surfaces. When the glue has dried, scrape off any excess and sand off the tail piece (using the nose of a belt sander) so that the curved edges flow smoothly into the rails. As shown in the photo on the preceding page, round over the top edge on both sides of these rail assemblies to within 1" of each end with a router and 3/8" rounding over bit. Now glue the rails (I-a) and (I-e) in position. Finish the frames as you did the head and footboards.

Earlier, you cut tenons down the side edges of the cross partitions (O). Cut center slots in two (O-a), and 26-7/8" from each end of the lengthwise partition (P) for cross lap joints. The other two cross partitions (O-b) will be positioned flat against the head and footboards. Cut a 3/4" wide, 3/8" deep dado down their centerlines to receive the ends of the lengthwise partition, as shown in Figures 3 and 7.

Since they don't show, the eighteen platform support strips (J) can be ripped from any scrap you might have lying around the shop. Glue and nail them to the sides of the partitions, flush with the top edges as shown in Figures 3, 6 and 7. Note that the cross partitions with dadoes (O-b) receive support strips only on the dadoed side, while the other two (O-a), and the lengthwise partition, have strips on both sides. I sanded and sealed the partition subassemblies with shellac.

Assembling the Bed

The assemblies you have made so far (head and footboards, side frames, and partitions) are the separate components that the bed can be broken down into for moving. To assemble the bed, these components are joined together with machine screws bolted through mending plates or into threaded inserts as detailed below.

Start by assembling the partitions and fitting their tongues into the grooves in the side stiles. Position a pair of 5" X 5/8" mending plates near the top and a pair of 2" X 1/2" plates near the bottom on each end of the two partitions (O-a) where they join the side stiles (H-a) as shown in Figure 3. Mount these mending plates on opposite sides so thay you can bolt them together with the partitions and side stiles between them (Figures 6 and 7). Mark the plate locations, drill 1/4" holes all the way through, and bolt them in place.

The mending plates on the two end partitions (O-b) are used not only to attach them to the side stiles (H-b), but they perform a second duty of securing the headboard or footboard to the rest of the assembly. Instead of through–bolting, you'll have one bolt running through the mending plate, through the side stile, and into a threaded insert mounted in the head/footboard frame (Figures 6 and 7). Use 5/8" flat head wood screws in the other holes. A little trial–and–error fitting is necessary here, so assemble and clamp the side frames, partitions and head and footboards together, and eyeball where the partitions, stiles and head and footboards come together.

Removing the end partitions (O-b) may help you figure out where to put the mending plates and threaded inserts. Position them such that the threaded inserts will be located in the 3/4" stock of the head and footboards while also lining up with one hole in each plate. As shown in Figures 6 and 7, use the outermost hole in the 5" plates in order to reach past the panels (L) to the head and footboard end stiles (F). The longer plates are especially necessary here, so that they will reach out far enough to permit mounting the threaded inserts into the head and footboard stiles—and not into their panels.

With the entire bed assembly clamped in position, check for squareness, and drill the holes, being careful not to drill all the way through the head and footboard stock. Remove the clamps and enlarge the holes in the 3/4" stock to the proper size (3/8" or 5/16" depending on the particular insert). It helps to lubricate the inserts with beeswax and turn them in with a socket wrench and short hex–headed bolt.

Put 1-1/4" X 1/4" machine screws through the outermost holes in the 5" plates, through the holes drilled in the end side stiles, and into the threaded inserts in the head and footboard stiles. I followed the same procedure with the 2" plates below, mounting the inserts in the bottom rails of the head and footboard. Figure 6 shows the approximate insert locations.

Assemble everything—put machine screws through the holes in the paired mending plates joining the partitions to the side stiles and secure them with nuts. Screw through the plates on the end partitions and stiles, and into the inserts in the head and footboards. Now, as shown in Figure 6, add corner braces in pairs on opposite sides above and below to strengthen the joints between partitions. Bolt them together through the center partition Install threaded inserts in the head and footboards, one above and one below, in line with one of the corner bracket holes in each pair. Figures 6 and 7 clarify where to put the screws and bolts.

Illustrations by Tom Larson

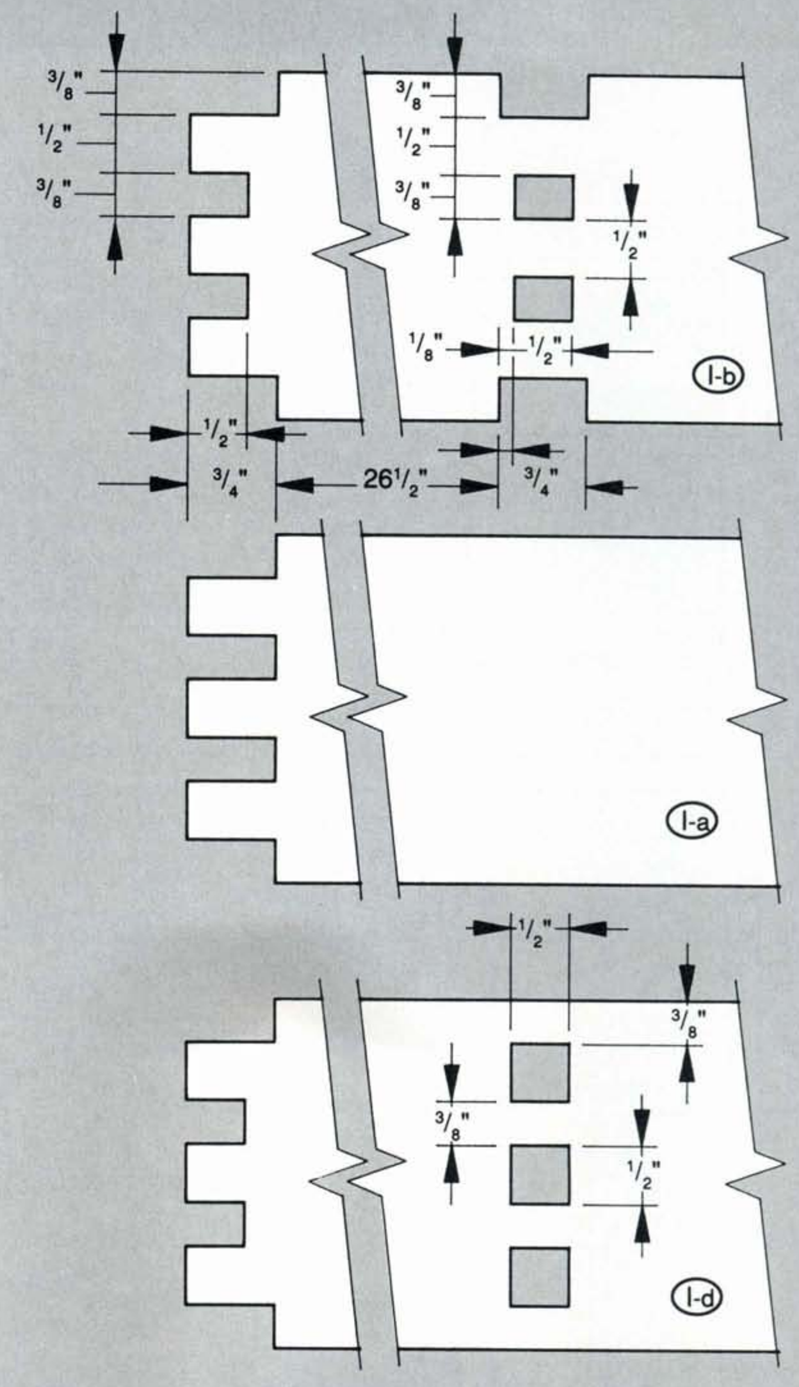


Figure 4. Side Rails

With everything together but the platform and drawers, you can mark where the dowel holes in the curved side pieces meet the head and foot board posts. Loosen the screws holding the boards to the side frames and end partitions, insert dowel centers, and retighten the screws. When you remove the head and footboards, the dowel centers should have precisely marked the drilling locations. Now glue pegs in the holes you made earlier in the curved pieces. Rejoin the head and footboards to the bed, carefully inserting the projecting ends of the pegs into their holes in the posts. Although no glue should be used in these holes (so the bed can be taken apart), the dry–fit pegs will provide enough strength to counter

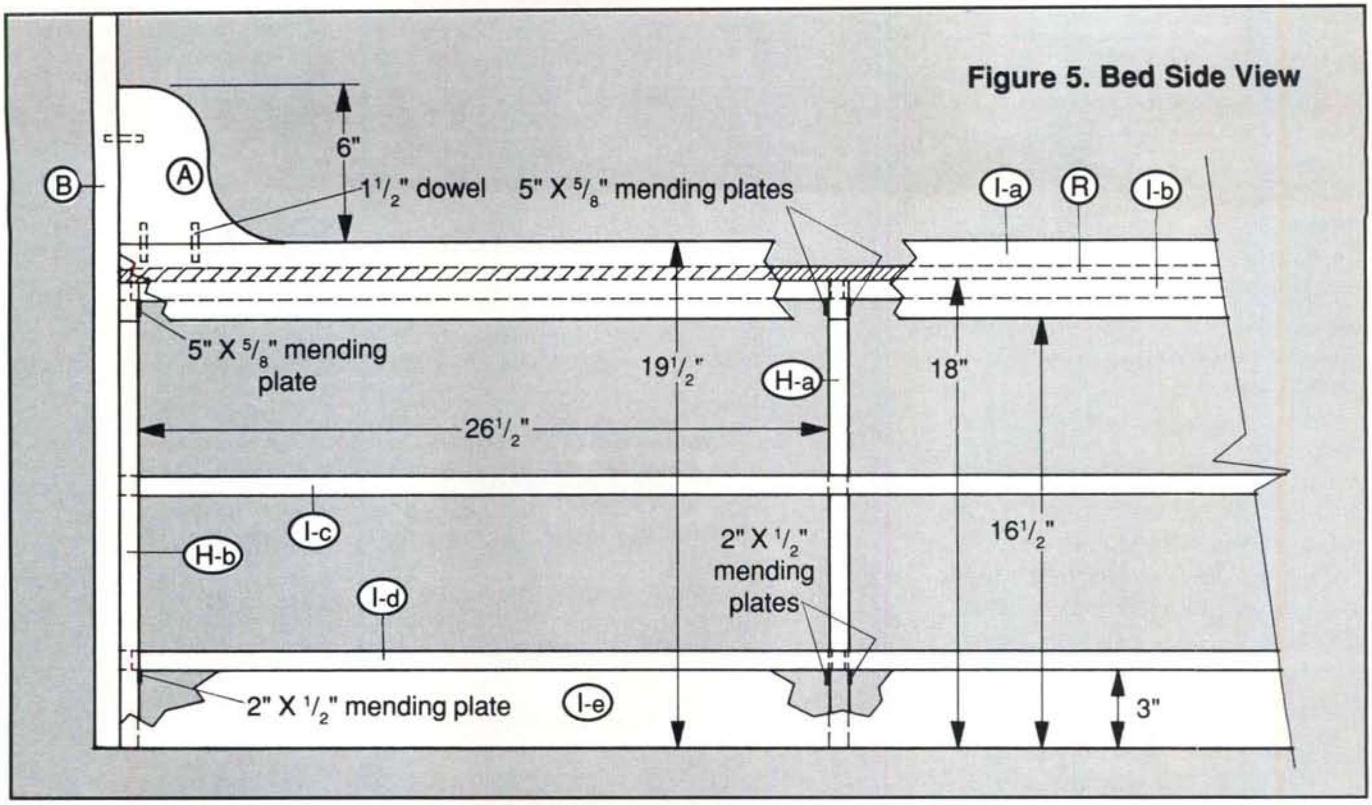


Figure 5. Bed Side View

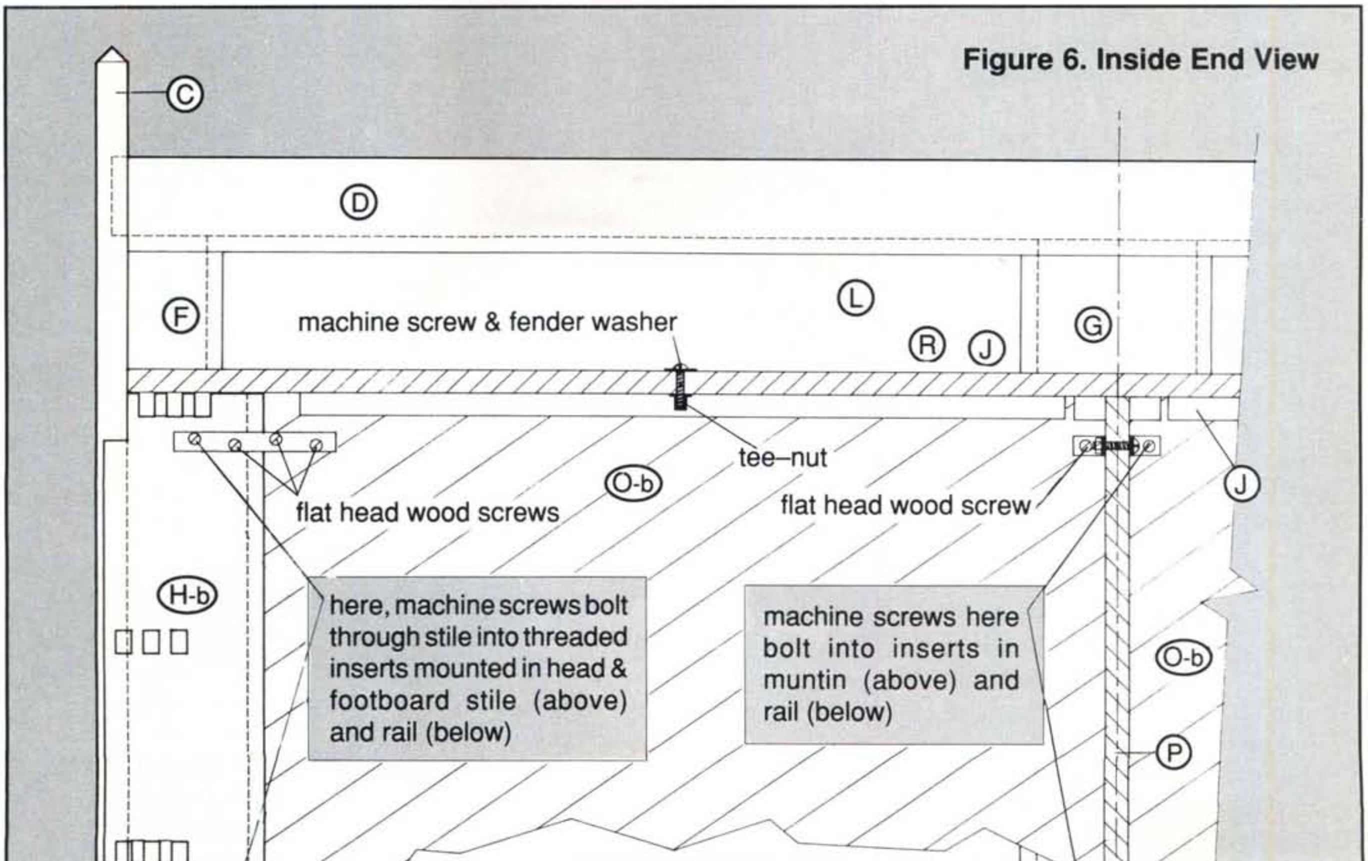


Figure 6. Inside End View

here, machine screws bolt through stile into threaded inserts mounted in head & footboard stile (above) and rail (below)

machine screws here bolt into inserts in muntin (above) and rail (below) any stress put on the curved pieces by the mattress.

Drill a hole in the centers of the support strips (J) and on the faces of the two top side rails for the T-nuts which secure the platform panels (see Figure 7). Place the platform panels (R) in position and mark the location of the holes from the underside. Turn the panels over and drill the holes. Replace the panels, insert the T-nuts and use 3/4" X 1/4" machine screws and fender washers (washers with oversized outside diameters) to attach the panels.

Drawers

Begin by cutting a 1/4" wide, 1/4" deep groove 5/16" from the bottom edge of the drawer sides (M) and ends (N) to accept the

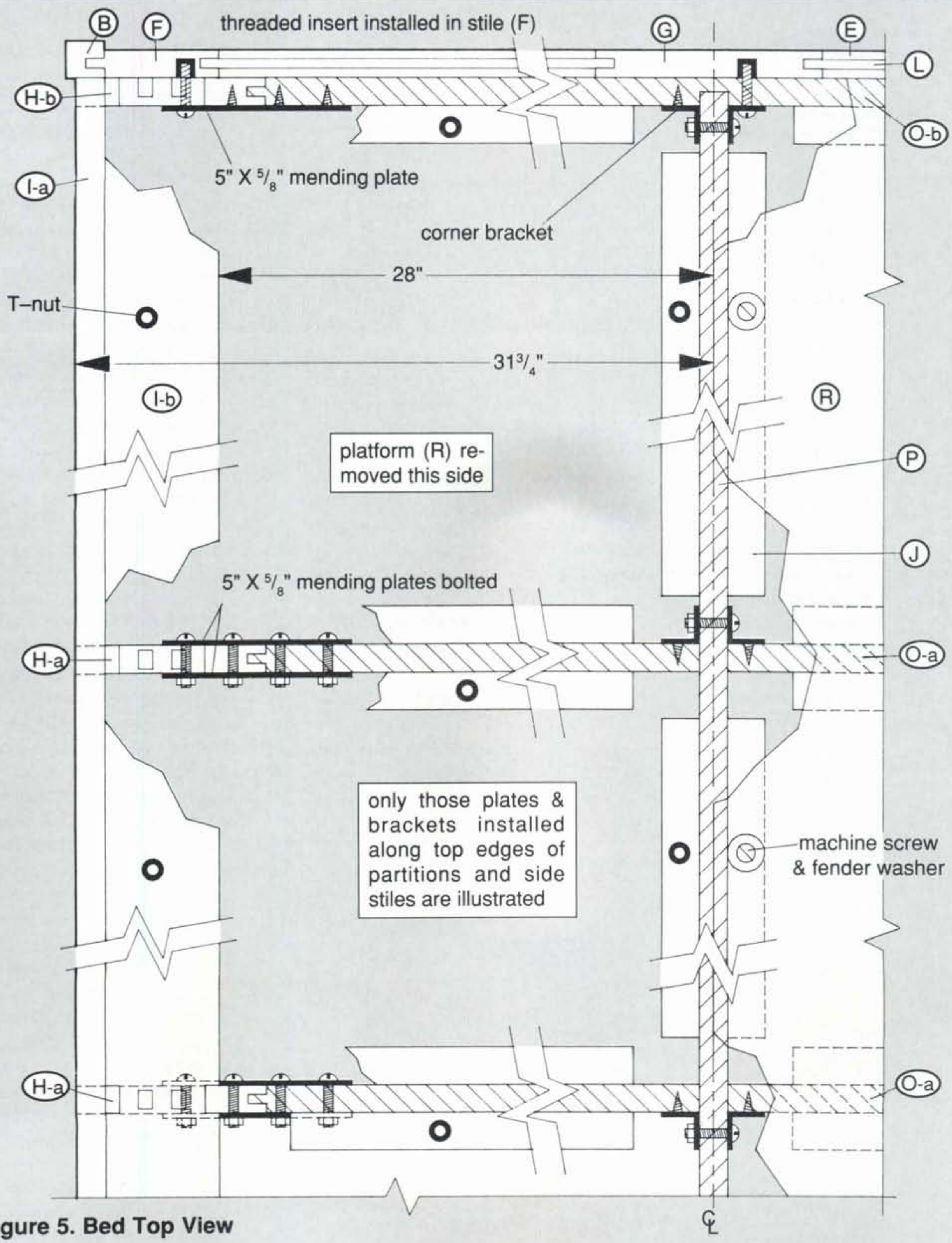
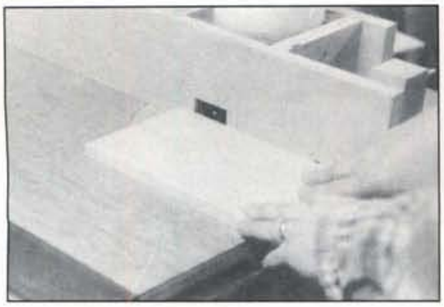
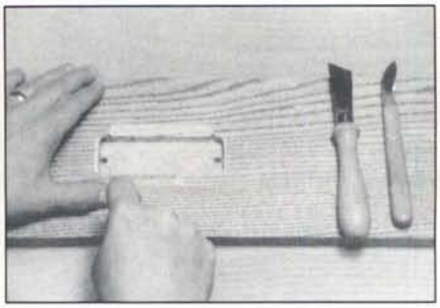

B
F
threaded insert installed in stile (F)
G
E
L
H-b
O-b
I-a
5" X $^5/_8$" mending plate
corner bracket
28"
T–nut
$31^3/_4$"
I-b
R
platform (R) removed this side
P
J
5" X $^5/_8$" mending plates bolted
H-a
O-a
only those plates & brackets installed along top edges of partitions and side stiles are illustrated
machine screw & fender washer
H-a
O-a
℄

Figure 5. Bed Top View

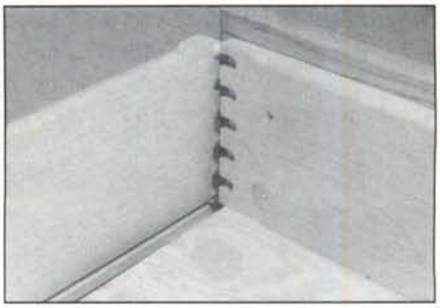


Drawer edges were rounded on a router table. Marks on the fence show where the ends of each board should be at the start and finish of each cut to allow for a one inch unrounded area.



The drawer handles were inlaid with the chip carving tools shown here. An inlay plane or small router would work well, too. The drawer front was stained before scribing and carving for clarity.

photos by the author



This detail shows the fully rounded drawer sides, half–round front, and unrounded portion at the end of each edge. Also illustrated are the two different ways of attaching the false drawer front described in the text.

drawer bottoms (Q). Cut these pieces to lengths that are appropriate for whatever joining method you use to make up the boxes. I routed dovetails; if you were to rabbet the corners, your finished lengths would need to be different. Each drawer should be custom fit, so measure the openings carefully and adjust the sizes as needed.

Rout to within 1" of the ends on the top edges of the drawer sides and ends with a 1/4" rounding over bit (photo above). Rout on both sides—except for twelve of the drawer ends which will join to the false fronts (K); these should be routed on the inside edge only as shown in Figure 8 and in the far right photo above. Drill and countersink a hole in each corner on the inside of these front ends 1-1/2" in from the edges for the 1" flat head wood screws that will attach the false fronts.

Dry–fit; then apply glue to the drawer sides and ends. Assemble them together with the bottoms, checking for squareness and that no glue stops the bottom panels from floating in their grooves. Clamp until the glue is dry; then seal and sand the drawer bodies. Install the drawer slide hardware according to their instructions. I used 22" Blum slides (see the Source List on page 71).

Trim the false fronts (K) to exact size (about 26-3/8" X 5-7/8"), allowing 1/16" clearance on each side. I used recessed brass campaign handles with a bail pull (see the Source List), but the following installation procedure should cover any recessed handle with blind attachments. First make a router template out of 1/4" hardboard or plywood and test it on scrap wood. Center the template on the drawer front and rout the mortise. To mark the attachment holes, try this method: cut the heads off two machine screws and sharpen the ends. Screw them into the threaded holes in the back of the handle and insert the handle into the mortise. A tap with a soft mallet when the handle is in position will mark the hole locations. Drill pilot holes in the mortise *and temporarily* fasten the handle to the drawer front with screws. Check the handle's position and scribe around it carefully with a sharp knife. Remove the handle and chiseling away the wood to the thickness of the handle, as shown in the center photo above. Remove the waste by chiseling from the mortise toward the scribed line. When you're finished, put the handles aside for installation after the next step.

To mount the drawer front on the drawer body, slide the body into position in the bed, place the front against it, and shim the front into position. Now use the handle pilot holes as guides to drill through the drawer body. Enlarge the holes to 1/4"—or whatever size machine screws your handles require. Remount the front by attaching the handle with 1" machine screws (those supplied with the handles probably won't be long enough) and fender washers. Adjust the position of the false front by tapping; then secure it with 1" flat head wood screws in the four countersunk holes you drilled earlier in the front end of the drawer body. If the front needs adjusting later, the flat head screws can be replaced by fender washers and round head wood screws (see the photo above).

Remove the handles, sand and finish the drawer fronts, and remount the handles. If you like, decorate the panels or central head and footboard stiles with carvings or other decorative work. My wife stenciled the stiles to match the room's border. Add a mattress, sheets and pillows, and you've got a brand new bed—and a fine piece of quality furniture. **PW**

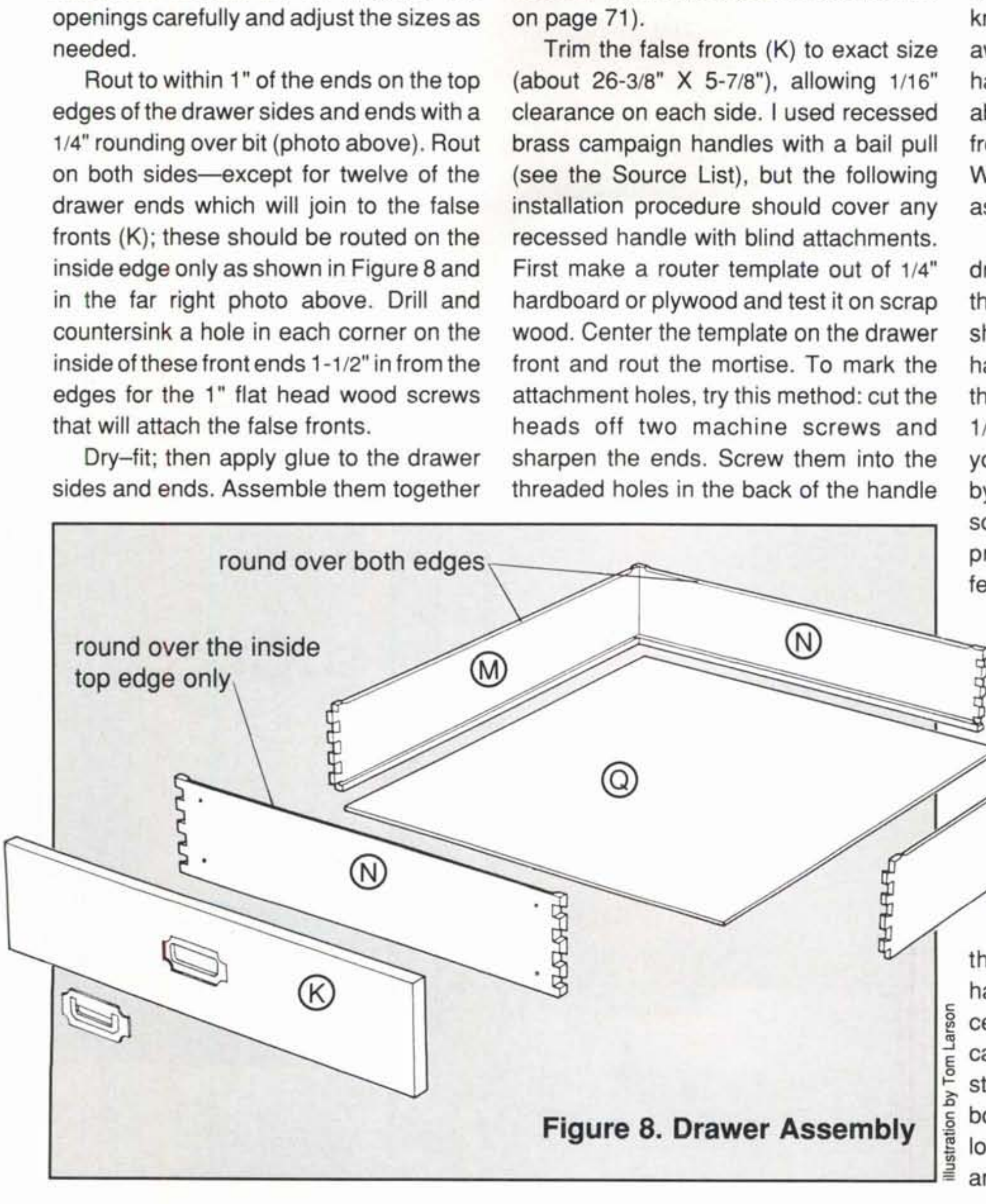


Figure 8. Drawer Assembly

illustration by Tom Larson

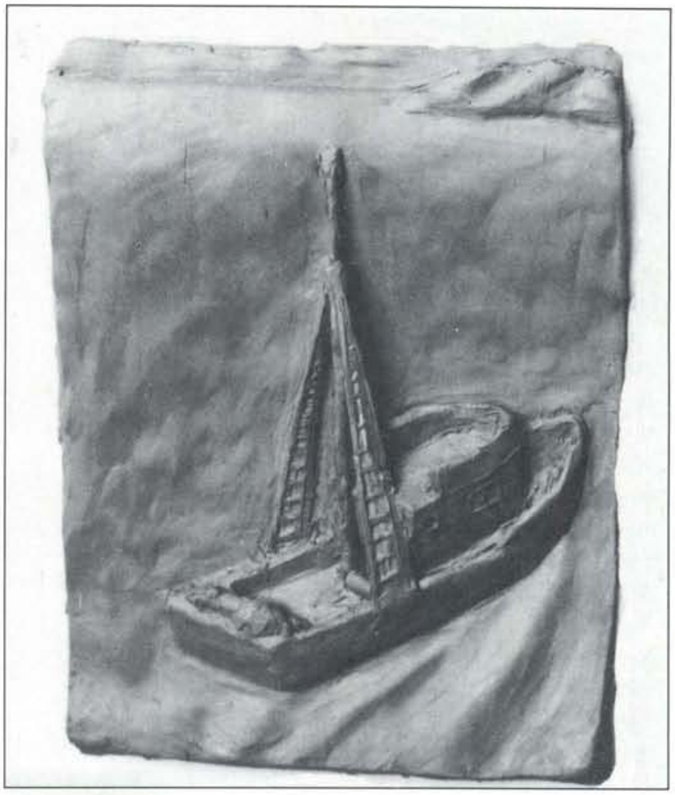
Carving Two–Point Perspective

by William H. McMaster

In the last two issues we developed the mechanical basis for the carving of a California fishing boat in perspective relief. A successful carving depends on more than just drafting a pattern. We'll make a clay model to create the illusion of depth directly. You'll gain insights that would not be possible if you just started carving. If the illusion doesn't look right after one try, you can change it until it does—something that would be impossible if you started carving right away. Relief carving is different than in–the–round carving in that you don't try to duplicate reality, but rather create the illusion of reality. There are many ways to create this illusion and we will combine the principles of inverse depth perspective with direct depth perspective and the techniques of foreshortening that we discussed in the previous articles.

For the clay model I chose grey-green Roma Plastilina of medium consistency (Number 2). This will be a relatively small carving, and you won't need to put fine details into the clay; so this choice is adequate for studying the illusion of depth. For a base to support the clay while modeling, I used a sink cutout which usually can be obtained for free from a cabinet shop that does kitchen counters. The clay adheres nicely to the plastic laminate surface which won't leech the oil out of the clay as untreated wood will do. You don't need an armature in this model except for the mast and the outboard rigging. Two pieces of plastic coated copper wire can be used for this purpose. The plastic coating prevents the sulphur in the clay from corroding the wire.

You'll need only a few tools: a flat wire tool for large cuts, a thin wire tool for detailing the boat, and a serrated wire tool for smoothing the ocean surface (which does not have to be done perfectly). The smoothing is accomplished by repeatedly cross hatching with the serrated tool and smoothing with your fingers until you have the relatively smooth surface needed to study the contours for the proper optical effect.

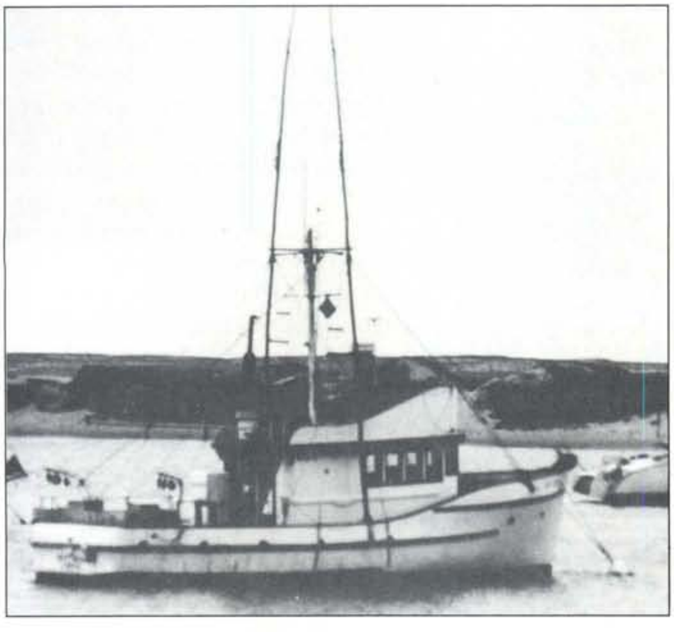


Make a clay model to get a feel for creating the illusion of depth.

Model the boat first, and when you have it to your satisfaction, add the ocean background. Put in some waves near the bow to give an illusion of motion. I've added a land–fall on the horizon of the scene to emphasize it and add interest. We'll use it to carve a view of the Battery Point lighthouse at Cresent City, California. The photograph shows the clay model and you should note how crude it is. The purpose is only to understand the carving. Figure 1 (on the next page) shows in cross section the contours developed in the clay model with reference to the pattern lines of Figure 2. Use these contours to provide guidance for the carving.

Notice how much of the carving is done near the top surface of the wood, no matter how far away it would be in real life. The illusion of depth is created by the many concave and convex surfaces going deep into the wood and forming defining shadows. The deepest part of the carving is near the bow of the boat, and you'll carve the water surface with a combination of direct and inverse depth perspective to effectively use the full depth of the wood.

In starting the carving I first mount the pattern directly on the board with a spray fixative. This will be cut off when V-tooling the outline and shaping the surface, so be sure to have a clear plastic



photos by the author

***William H. McMaster** is Chief of the Education Division of the California Carvers' Guild. His "Focus on Carving" is a regular feature in PW.*

copy of your pattern to use as you proceed further. After carving awhile, it's best to wear a cotton cosmetic glove (available at drugstores) on your left hand to keep the skin oils off the wood, especially if you're using basswood as I did.

Carve a relief of this type with your wood positioned at a minimum of forty five degrees. When carving horizontally, you tend to lose your sense of perspective. This is particularly true for larger relief carvings. As you carve, frequently stand back about eight to ten feet and view your carving in a strong side or top light so you can see the effect of the shadows. Remember, interpretation by the eye is the key to a successful perspective carving.

Start the carving by roughly shaping the water surface. The first cut is made with a V-tool to establish the horizon. Then establish the low of the water surface near the boat using a deep gouge along the regions of cuts two and three as shown in Figure 3 on page 80. These cuts slope down from the outer edges of the carving until they reach full depth at the bow and stern. Notice that they go to a depth of about 17 mm at the bow into the 19 mm thick wood. Be careful and don't over cut or you'll go through the board; in fact, go a little shy of the full depth now so that you'll have space for the final shaping and finishing. Cut this groove first to establish the depth, and then shape the concave curvature of the water, phasing in to this depth. Do not finish the water surface at this time.

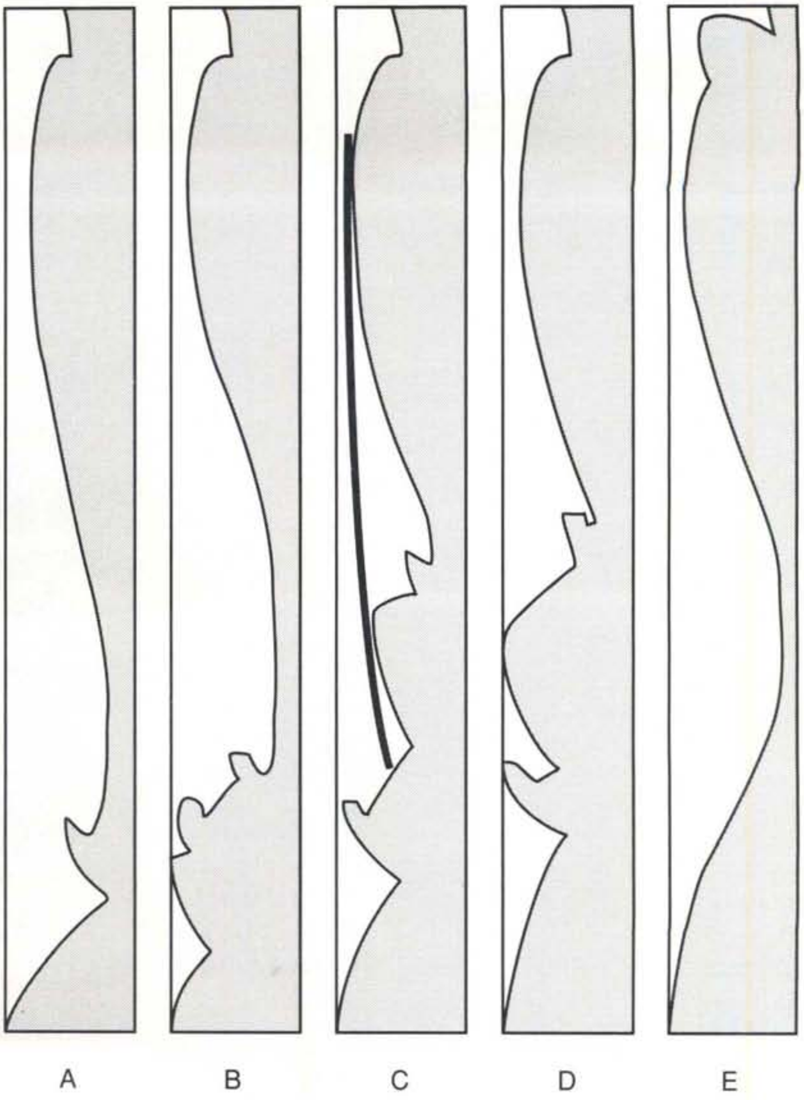
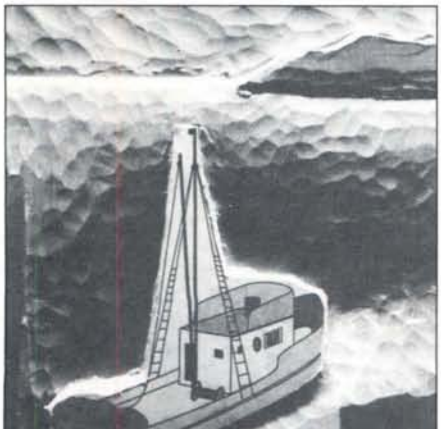
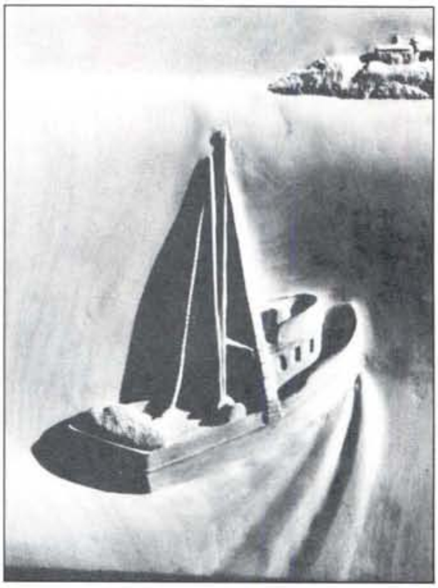


Figure 1. Cross Sectional Countours

The photo below shows the initial rough–out cuts. In the photo below right, notice that the lighthouse and boat details have been started. The shadows mark the contours of the water.



photos by the author



The water and the boat must be coordinated to get the desired optical effect, and you'll want to see how the boat looks on it.

The next step is to shape the hull and then the water according to the profiles of Figure 1. To get the proper depths use a depth gauge made by laying a ruler across the uncut wood and a nail or wire to find the depth as shown in Figure 4 on page 80. This is especially important for the very deep cuts. In Figure 1 note how many points on the boat are carved near the original surface of the wood. Also note that the horizon meets the sky perpendicularly. This will make it appear darker in contrast to the sky, thus increasing the illusion of depth.

Once the hull has been shaped, rough–in the cabin so you can place the

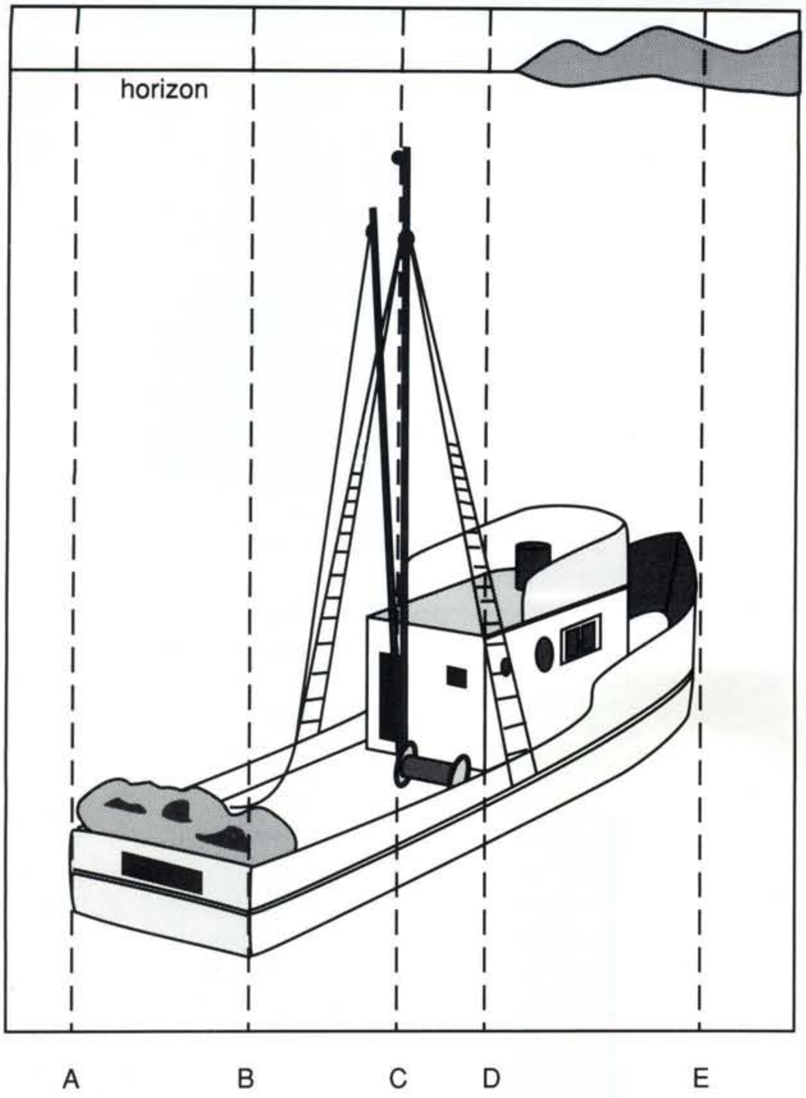


Figure 2. Pattern with Section Lines

illustrations by the author

mast and rigging. These outermost forms are done before the final shaping of the cabin. The amount of wood required for them determines the depth at which you can carve the cabin. The cabin is the most difficult part of this project; its sides must be parallel to the hull and the spacing must look realistic. Be sure to get this correct in the clay model and follow it carefully when you carve the wood. Once the mast and rigging have been carved, finish shaping the cabin and work on the finer details of the boat. You will need small gouges for this purpose and I prefer to use those that can be held in the hand like a pencil. They give the best control for detail work.

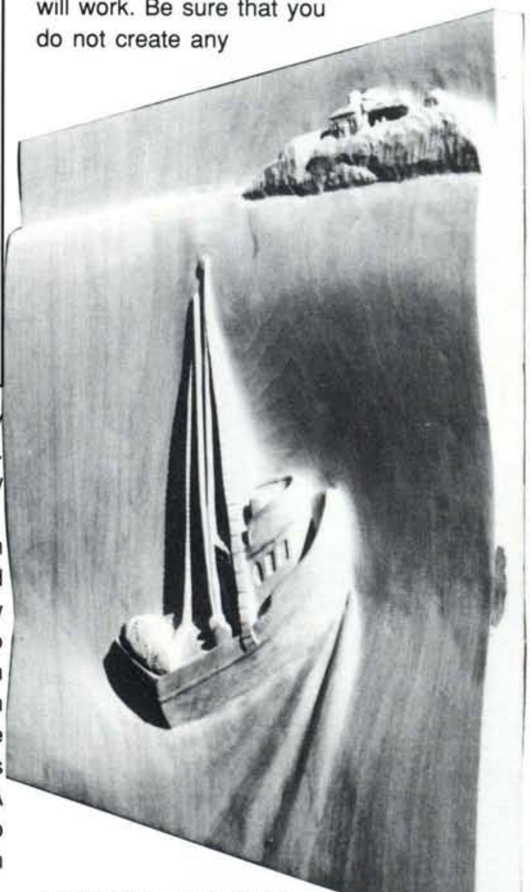
Once you've rough–shaped everything, check contours by moving a ruler across the surface under a spotlight and watching the shadow. This will reveal any hard–to–see irregularities in the contour. Stand back frequently and observe how the shape looks.

When the shape of the water has been determined, carve in the bow waves and the turbulence behind the stern. The bow waves are started using a deep gouge to carve out the troughs as shown in region A of Figure 3. The bow waves are then rounded over into these hollows. The region behind the stern below line B is fairly flat and sloping in from the corner. A smooth curve along B phases the two contours of the water into each other in this region.

An ocean is not smooth, so carve in some cross waves in the foreground, especially in the lower right hand corner of the carving. These are the larger ones; carve them deep enough to cast shadows. The smaller ripples are put in later and give a texture to the surface.

I have found that texturing is best done on a smooth surface. Therefore, sand all parts smooth and check their contour shadows. On the larger expanses of the water surface, I used an orbital sander to speed the process along. Then, to make the boat more realistic, the mast and rigging were completely cut through at the deep regions. This helps achieve continuity when texturing the water.

The final step is to texture the small ripples and wavelets. Keep in mind that the farther away they are in the scene, the smaller, closer together, and less well defined these details are. The texturing is done with a ball–nose shaped U–tool. For the foreground I used a 4 mm blade and I completed the background with a 2 mm blade. The ripples are carved close together in a generally horizontal fashion with short strokes, and the edges are smoothed using a fine pad of Scotch-brite. If that's not available, fine steel wool will work. Be sure that you do not create any



In this oblique angle photo, the shadows clearly reveal the concave–convex surfaces and the actual differences in depth.

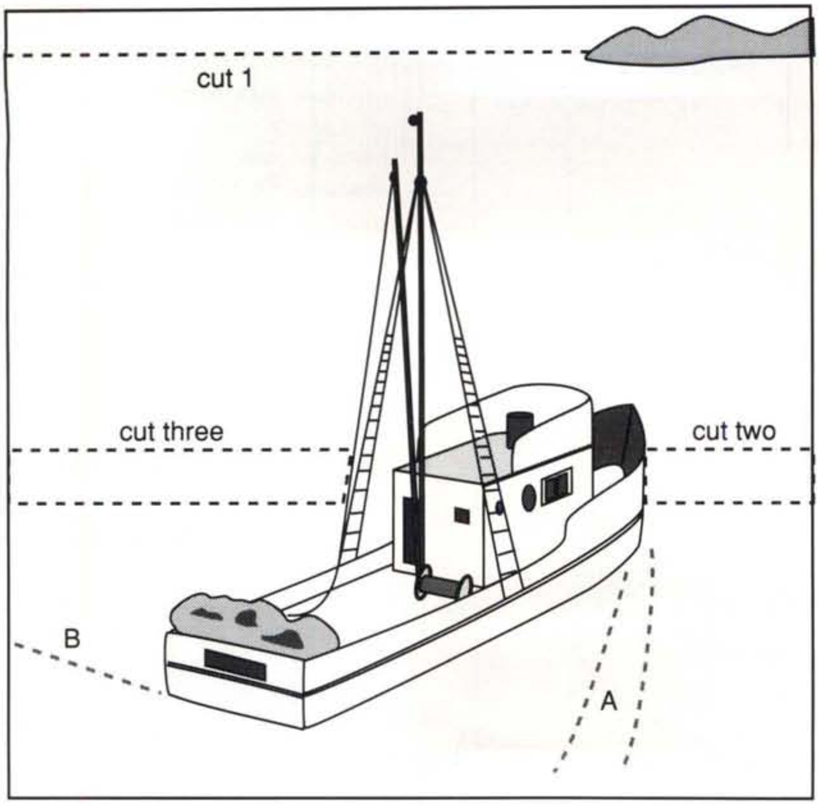
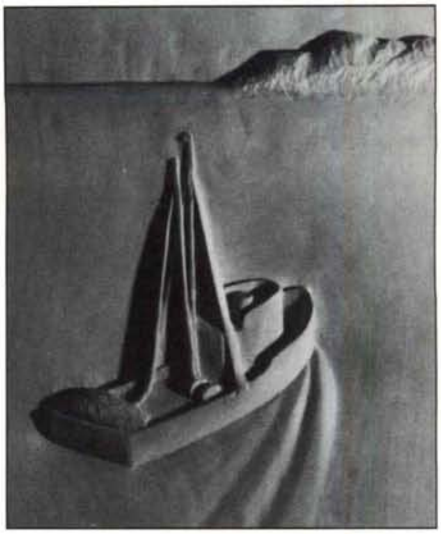


Figure 3. Initial Cuts

photos and illustrations by the author



All surfaces are shaped and smoothed before detail carving.

geometrical patterns while texturing.

If you're using basswood, a stain is appropriate. First cover the carving with McCloskey pre-stain. After it dries, you can make corrections in the carving and resand any area needing it. Use the Scotch-brite to remove any little fuzzies. The prestain makes the wood somewhat gummy, so be sure your tools are sharp if you are going to carve after the surface has been coated. Recoat the surface if you rework it, or the stain won't go on properly. I then applied McCloskey pecan stain.

Our carving of a fishing boat in the Cresent City harbor with the Battery Point Lighthouse in the distance is complete. We have used the principles of depth perspective and foreshortening developed in the previous two articles of this series. I hope you now have a feel for these techniques which produce the illusion of depth in a shallow piece of wood, and are ready to apply them to carvings of your own design. PW

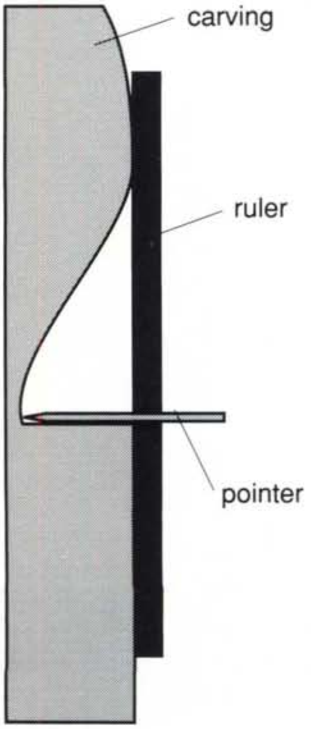
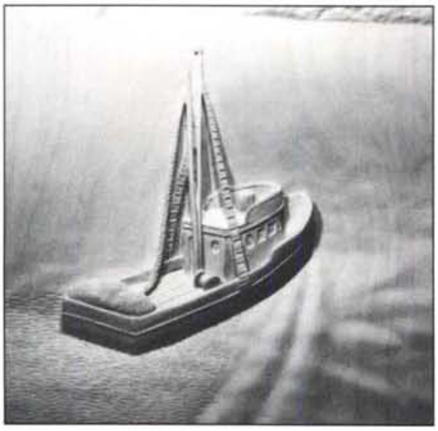
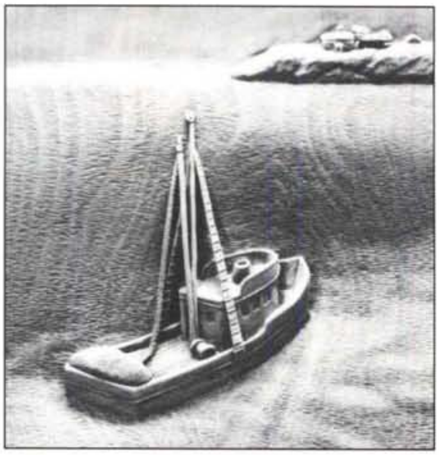


Figure 4. Measuring Depth of Cut





After smoothing, the waves are textured as shown to the left above. The finished carving before framing appears at left.

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Calendar

Events of Interest to Woodworkers

If your group is having an event you would like other woodworkers to hear about, please send us all pertinent information at least three months before the opening date. We will publish it for you in *Calendar* free of charge.

Arkansas

Date: May 26-July 22
Event: International Turned Objects Show
Location: Arkansas Art Center, Little Rock

This juried selection of notable lathe-turned works from around the world premiered in 1988 at the Port of History Museum in Philadelphia, and is now touring North America through January 1991
For information, contact: Sarah Tanguy or Jonathon Glus at the International Sculpture Center, 1050 Potomac Street, N. W., Washington, D. C. 20007. Tel. (202) 965-6066

California

Date: May 5-6 & 12-13
Event: Building the Norwegian Pram with Simon Watts
Location: National Maritime Association, San Francisco
For information, contact: National Maritime Assoc., Bldg. 275, Crissy Field, San Francisco, CA 94129. Tel. (415) 929-0202

Date: May 11-13
Event: Southern California Woodworking Show
Location: Pasadena Center, 300 E. Green St., Pasadena
For information, contact: 1990 Woodworking Shows, 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521 or 1-800-826-8257

Date: May 19-June 3
Event: Ninth Annual College of the Redwoods Furniture Show
Location: Highlight Gallery, 45052 Main St., Mendocino, CA 95460
For information, contact: College of the Redwoods, 440 Alger St., Fort Bragg, CA 95437. Tel. (707) 964-7056

Date: June 4-15
Event: Workshop: Basic Carving with Robert Fowler
Location: College of the Redwoods
For information, contact: College of the Redwoods Woodworking Program, 440 Alger St., Fort Bragg, CA 95437. Tel. (707) 964-7056

Date: June 9-16
Event: Building the Herreshoff Pram with Simon Watts
Location: National Maritime Association, San Francisco
For information, contact: National Maritime Assoc., Bldg. 275, Crissy Field, San Francisco, CA 94129. Tel. (415) 929-0202

Connecticut

Date: June 1-3
Event: Spring Crafts Festival
Location: Berlin Fairgrounds, Berlin, CT

Juried shows, 200-250 exhibitors
For information, contact: Arts & Crafts Festivals, Box 412, Canton, CT 06019. Tel (203) 693-6335

Georgia

Date: May 4-6
Event: A Salute to American Crafts
Location: Atlanta Apparel Mart, Atlanta, GA
For information, contact: American Craft Enterprises, Box 10, New Paltz, NY 12561. Tel.1-800-836-3470

Illinois

Date: April 20-22
Event: Chicagoland Woodworking Show
Location: Odeum, 1033 N. Villa Ave., Villa Park
For information, contact: 1990 Woodworking Shows, 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521 or 1-800-826-8257

Maine

Date: April 27-29
Event: 1st Annual Portland Woodworking World Show
Location: Portland Expo Building, 239 Park Ave., Portland
For information, contact: Woodworking Association of North America, Box 706, Plymouth, NH 03264. Tel. (800) 521-7623 or (603) 536-3768

Maryland

Date: April 27-29
Event: Ward World Championship Wildfowl Carving Competition
Location: Ocean City Convention Center, Ocean City
For information, contact: Jane Rollins, Ward Museum of Wildfowl Art, Salisbury State University University, Salisbury MD. Tel. 1-880- 742-4988

Date: June 10-16 & 17-23
Event: Summer Carving Workshops
Location: Salisbury State University, Salisbury
For information, contact: Christine Brown, Salisbury State University University, Salisbury MD. Tel. 1-880- 742-4988

Massachusetts

Date: April 7 & 8
Event: Design & Construction with Bent Wood/Wood Forming, Michael Fortune
Location: Worcester Craft Center, 25 Sagamore Rd., Worcester, MA
For information, contact: Worcester Craft Center, 25 Sagamore Rd., Worcester, MA 01605. Tel. (508) 753-8183

Date: May 18-20
Event: 20th Annual May Craft Fair
Location: Worcester Craft Center, 25 Sagamore Rd., Worcester, MA
For information, contact: Worcester Craft Center (see above)

Minnesota

Date: April 6-8
Event: ACC Craft Fair Minneapolis
Location: Minneapolis Convention Center
For information, contact: American Craft Enterprises, Box 10, New Paltz, NY 12561. Tel.1-800-836-3470

Nebraska

Date: May 4-6
Event: Nebraska Woodworking Show
Location: Aksarben Field, 63rd & Shirley Streets, Omaha
For information, contact: 1990 Woodworking Shows, 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521 or 1-800-826-8257

New Jersey

Date: April 21-22
Event: Flemington Crafts Festival
Location: Flemington Fairgrounds, Flemington
For information, contact: United Craft Enterprises, Box 326, Masonville, NY 13804. Tel. (607) 265-3230

Date: May 20
Event: Arts & Crafts at Verona Park
Location: Verona Park, Verona, NJ
For information, contact: Rose Squared Productions, 12 Galaxy Court, Belle Mead, NJ 08502. Tel. (201) 874-5247

Date: June 2-3
Event: Spring Nomahegan Park Art & Crafts Show
Location: Nomahegan Park, Cranford, NJ
For information, contact: Rose Squared Productions, 12 Galaxy Court, Belle Mead, NJ 08502. Tel. (201) 874-5247

New Mexico

Date: April 14-15 & 21-22
Event: Building the Norwegian Pram with Simon Watts
Location: Albuquerque Woodworkers Association
For information, contact: Jim Linke, Albuquerque Woodworkers Assoc.,1414 Silver St., Albuquerque, NM 87106. Tel. (505) 243-7234

New York

Date: April 6-8
Event: Second Annual Buffalo Show
Location: Erie County Fairgrounds, 5600 McKinley Parkway, Hamburg
For information, contact: Woodworking Association of North America, Box 706, Plymouth, NH 03264. Tel.1-800-521-7623 or (603) 536-3768

Date: May 11-13
Event: American Craft at the Armory
Location: Seventh Regiment Armory, New York, NY
For information, contact: American Craft Enterprises, Box 10, New Paltz, NY 12561. Tel.1-800-836-3470

Date: June 14-17
Event: Sixth Annual National Conference
Location: Rensselaer Polytechnic Institute, Troy
For information, contact: Timber Framers Guild of North America, Box 1046, Keene, NH 03431. Tel. (603) 357-1706

North Carolina

Date: April 19-27
Event: Class: Wood, Craft, Art
Location: Penland School, Penland
For information, contact: Registrar, Penland School, Penland, NC 28765. Tel. (704) 765-2359

Date: April 19-27
Event: American Craft Showroom
Location: High Point, NC
For information, contact: Buyers Markets of American Crafts, 3000 Chestnut Ave., suite 300, Baltimore, MD 21211. Tel. (301) 889-2933

Date: May 28-June 8
Event: Class: Wood Carving & Shaping
Location: Penland School, Penland
For information, contact: Registrar, Penland School, Penland, NC 28765. Tel. (704) 765-2359

Date: June 11-22
Event: Class: Furniture Design
Location: Penland School, Penland
For information, contact: Registrar, Penland School (see above)

Ohio

Date: April 6-8
Event: Greater Cleveland Woodworking Show
Location: I–X Center, 6200 Riverside Drive, Cleveland
For information, contact: 1990 Woodworking Shows, 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521 or 1-800-826-8257

Oklahoma

Date: April 7
Event: Workshop: Between Centers
Location: Moore–Norman School, Norman
For information, contact: Dianna Ewoldt, Moore–Norman Voc–Tech School, 4701, 12th Ave. NW, Norman, OK 73069. Tel. (405) 364-5763 ext 261

Date: April 21
Event: Turned Lidded Boxes
Location: Moore–Norman School, Norman
For information, contact: Dianna Ewoldt, Moore–Norman Voc–Tech School (see above)

Oregon

Date: March 17-April 14
Event: Women in the Woods
Location: Made in Jefferson Gallery
Exhibit of Northwest women woodworkers
For information, contact: Made in Jefferson Gallery, Jefferson, OR

Date: April 29
Event: Seminar: Woodworkers & Users Guide to the Spinning Wheel
Location: Oregon School of Arts & Crafts, 8245 SW Barned Rd., Portland, OR 97225
For information, contact: Becky Banyas, Tel. (503) 297-5544

Date: April 29-May 12
Event: Table, Lamp + Chair: Designers Take A Dare!
Location: Foundry Loft Apartments, 849 NW Everett, Portland
Furniture and lighting design competition & workshops; entry forms due April 6
For information, contact: IBD, 2701 NW Vaughn St., suite 608D, Portland, OR 97210-5328

Date: May 6
Event: Seminar: Art & Practice of Bird Carving
Location: Oregon School of Arts & Crafts, 8245 SW Barns Rd., Portland, OR 97225
For information, contact: Becky Banyas, Tel. (503) 297-5544

Date: May 19 & 20
Event: Seminar: Stool Design & Construction
Location: Oregon School of Arts & Crafts, 8245 SW Barns Rd., Portland, OR 97225
For information, contact: Becky Banyas, Tel. (503) 297-5544

Pennsylvania

Date: April 21-22
Event: 1990 Craft Workshops
Location: State College, Pennsylvania
Furniture Design and Construction with Tage Frid
For information, contact: Pennsylvania Guild of Craftsmen, Box 820, Richboro, PA 18954. Tel. 215-860-0731

Date: opens April 21
Event: Pennsylvania Lathe–Turned Objects
Location: Woodmere Art Museum
For information, contact: Woodmere Art Museum, 9201 Germantown Ave., Philadelphia, PA 19118. Tel. (215) 247-0476

Tennessee

Date: April 19-May 19
Event: Rude Osolnik: A Retrospective
Location: Arrowmont School of Arts & Crafts, Gatlinburg
For information, contact: Arrowmont SummerWorkshops, Box 567, Gatlinburg, TN 37738. Tel. (615) 436-5860

Date: June 4-8
Event: Workshop: Segmented & Staved Decorative Turnings
Location: Arrowmont School of Arts & Crafts, Gatlinburg
For information, contact: Arrowmont SummerWorkshops (see above)

Date: June 11-15
Event: Woodturning–Functional & Artistic
Location: Arrowmont School of Arts & Crafts, Gatlinburg
For information, contact: Arrowmont SummerWorkshops (see above)

Utah

Date: April 27-29
Event: Utah Woodworking Show
Location: Salt Palace, 100 SW Temple St., Salt Lake City
For information, contact: 1990 Woodworking Shows, 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521 or 1-800-826-8257

Washington

Date: April 5-May 31
Event: Dinner for Eight (exhibit of dining sets)
Location: Northwest Gallery of Fine Woodworking, Pioneer Square
For information, contact: Northwest Gallery, 202 First Ave. S, Seattle, WA 98104. Tel. (206) 625-0542

Date: opening May 25
Event: Lamp & Lighting Show
Location: Artwood Gallery of Fine Woodworking, Bellingham
For information, contact: Artwood, 1000 Harris Ave., Bellingham, WA 98225. Tel. (206) 647-1628

West Virginia

Date: April 23-29
Event: Class: Chip Carving
Part of Spring Dulcimer Week
Location: Davis & Elkins College, Elkins
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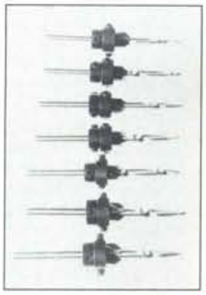

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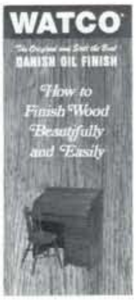
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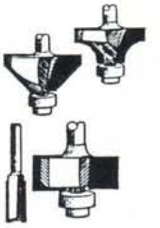

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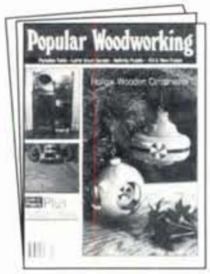

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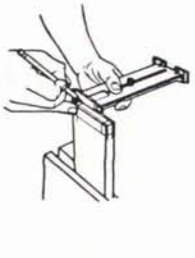

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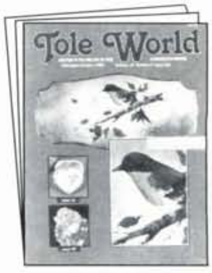

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WOODS

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INFORMATIVE 208–PAGE CATALOG for woodworkers, woodcarvers, upholsterers, antique restorers, including many unusual, hard–to–find items. Send $1.00 to Van Dyke's, Dept. 50, Woonsocket, SD 57385

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CLASSIFIED INFORMATION:

Classified Rate: $1.50 per word; 15–word minimum; **Classified Display:** $150 per inch for 1 issue, $110 per inch for 6–time rate (6 consecutive issues). Payment must accompany all Classified ads (not commissionable). Deadline for Issue 55 (July1990) is April 2, 1990. ***Popular Woodworking,*** 1320 Galaxy Way, Concord, CA 94520, (415) 671-9852.

Out of the Woodwork

by Elaine E. Laney

The Other Side

They say that when your children grow up and leave home, you soon find yourself missing the peanut butter and jelly on the door knobs, the dirty clothes and homework papers stuffed under the bed, and not being able to use the telephone whenever you please. They're right.

This fact makes me wonder what I would miss if my husband were not a woodworker. What first comes to mind are the stacks of woodworking magazines and project plans which have to be moved and put back each time I vacuum the carpet in his den. That's exercise I could possibly go to flab without. And what about the problem of storage space? It's pitifully lacking in the basement of our little ranch house for anything not directly connected to the working or storing of wood and tools. If he didn't enjoy his hobby, then I suppose we wouldn't have to rent the mini–warehouse for storing our Christmas decorations, garden tools, lawnmower, and for those various boxes of junk we've accumulated over the years.

Around 11 pm I would miss the shrill sound of his router as he executes yet another magic maneuver, while remaining perfectly oblivious of the hour. And the odors.... I can't forget that life would be dull without the fragrance of turpentine permeating the house... the aroma of the many paints and stains, some of them secret home–brews concocted from vinegar, ammonia, and the like... and the pungent scent of fresh–sawn lumber still smoking on the table saw—were it not for the tell–tale buzzing of the blade, you'd swear the house was afire.

Elaine Laney *is an architectural draftsman, free–lance writer and the wife of a wood addict in Hendersonville, North Carolina.*

"I wish he'd get another set of plans... I'm tired of these FHA models."

Ahhh, the sawdust throughout the carpet and his clothes now comes to mind. Once in the washer, sawdust becomes an integral part of each laundered load, doing it's scouring side–by–side with the detergent. And there are the wood chips and those little spiral shavings from his block plane, always lurking on the cellar stairs, awaiting a sneakered foot to transport them into our living areas. They never wait in vain, or for long. Our cats play with the springy shavings the way other housecats play with balls of yarn.

I would miss the thrill of finding a check written to a specialty lumberyard for an unpronounceable wood species costing $40 a board foot. I would be deprived of the challenge of trying every solvent known to woman in an effort to remove a hardened glob of waterproof glue from the pocket front of a good shirt. My car would no longer be permitted the luxury of parking in the fresh air at curbside, but would have to lodge in the carport where now are stored his homemade wooden boat together with stacks of downed tree parts, awaiting his saw and the requisite number of years of drying in the mountain air.

Most of all, I would feel let down at not being an indispensable part of his hobby. Gone forever would be those romantic moments when he calls me away from cooking dinner to provide an extra pair of hands to hold, measure, clamp, push, pull, spread glue, or give approval, support or consolation.

Of course, I suppose I would miss running into things—the homemade spring pole lathe in the middle of the darkened basement (positioned there so I would notice it?)... the sixteen–foot 2 X 12 in the lumber rack designed for fourteen–footers (those extra two feet can decapitate you if you pass by at a speed above "mosey"). And that cabinet placed strategically in a sunny basement window that somehow nearly broke my shin—oh, how foolish I was—I could have *hurt* that cabinet! I could miss that kind of excitement, too (I wish I'd missed the darn cabinet).

Now that I've laid them out before me, maybe I wouldn't miss these things in my life, but...

I'd surely not enjoy doing without the linen cabinet he built... the living room chair, the bedside table, my home drafting board, the dining room hutch, the lady's writing desk, the scores of small stands, stools, bookcases, racks, shelves, closet organizers, storage cabinets and boxes.

Where would we be without his dexterity and handiness, or without the dozens of space–consuming but truly ingenious, lovely–to–look–at, one–of–a–kind hand tools he's crafted himself? We would be rickety–rackety falling apart—that's where we'd be! So keep on woodworking, dear, and as soon as I hear the belt sander turn off, I'll go down in the basement and tell you so. I'll check the progress of your latest project, and if I'm lucky I'll get a sawdust hug. Because of that dust, I have lots of tan in my wardrobe. I may look better in bright colors, but I'd rather have the hugs! **PW**

Next Time

Howard French

Hugh Foster

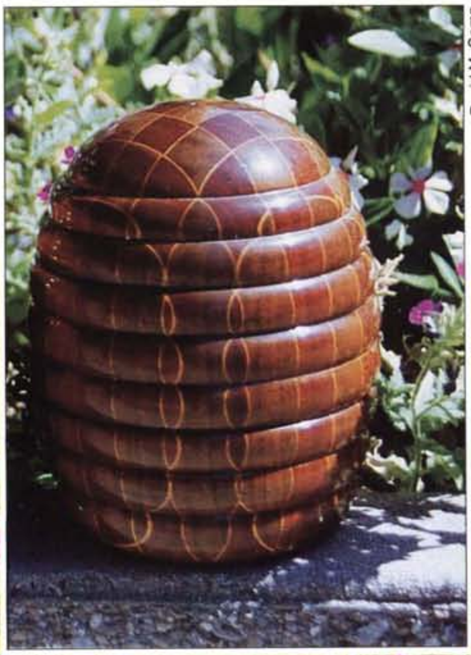
Coming up
in the July Issue of
Popular Woodworking:

Old–Fashioned
School Desk

Special Planes

Bee Hive Jewel Chest

and much more...


David M. Camp

On sale in
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Powerful plunge routers have always been beyond the grasp of budget-conscious woodworkers.

That is, until Skil handed them the new Model 1835.

This versatile tool combines smooth plunging action with a powerful 1¾ H.P. motor.

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You can also rout out a separate niche with our 1½ H.P. version, the Model 1823 plunge router.

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